JUNE 1951

The Paper Industry

TECHNOLOGY DEPT.

JUN 21 1951
DETROIT

Pioneering pays off

In cooperation with far-sighted mill management, Sutherland has opened a new era in wood conservation, lower operating costs, and higher profits.

SUTHERLAND
High Yield Sulphate System
patent pending

This system, an outstanding result of collaboration between engineering and management, is a major step in our industrial progress.

SUTHERLAND

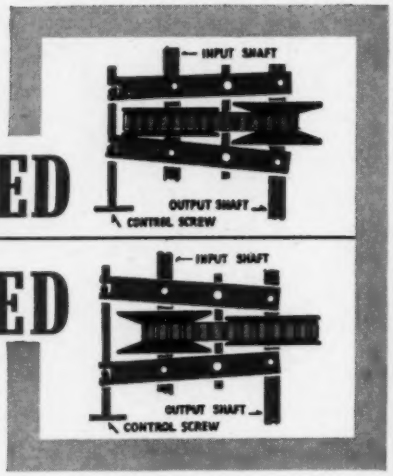
Designed, Engineered, Serviced

continuous beating systems

by SUTHERLAND REFINER CORPORATION

TRENTON 8, N. J.

Only with the P.I.V. variable speed drive can you go from MAXIMUM SPEED to MINIMUM SPEED in an infinite number of positive settings!



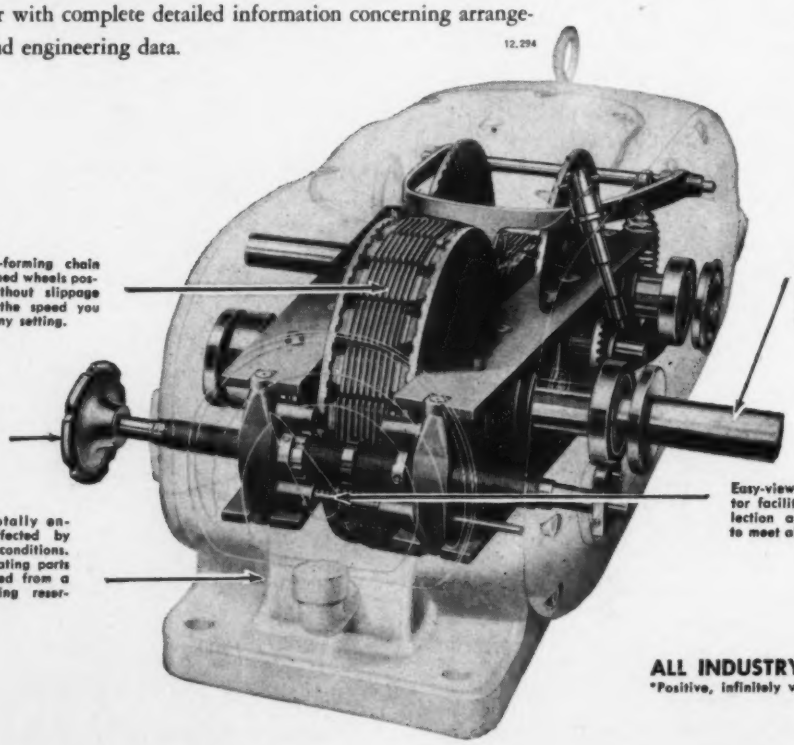
Here's the only variable speed drive on the market today that's not dependent on friction. Link-Belt's P.I.V. gives you exact speed selection in *positive*, infinitely variable settings . . . transmits full rated horsepower throughout its complete range.

Find out how Link-Belt's P.I.V. can increase the flexibility and efficiency of your machines. Call the branch office near you. Pre-selection of the right P.I.V. variable speed transmission for your needs can be readily obtained together with complete detailed information concerning arrangements, ratings and engineering data.

12.294

LINK-BELT P.I.V. VARIABLE SPEED DRIVE

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.



Self-tooth-forming chain grips toothed wheels positively without slippage — gives the speed you need at any setting.

An infinite number of positive, stepless speed adjustments may be made with manual, electric, pneumatic or hydraulic controls.

All-metal, totally enclosed — unaffected by atmospheric conditions. All vital operating parts splash-lubricated from a common housing reservoir.

You can get minute speed changes and maintain them accurately while operating under full load.

Easy-view speed indicator facilitates speed selection and adjustments to meet all requirements.

ALL INDUSTRY USES P.I.V.*

*Positive, infinitely variable

IMAGINE...

America without paper!

No wraps . . . no bags . . . no cartons! Imagine the consternation of Mrs. America at market. Not only would *convenience* vanish . . . but the miracle of American merchandising and marketing methods would disappear almost instantly. Orders, shipments, store stocks . . . all in a state of chaos. America's standard of living . . . and the nation's health . . . would be severely affected . . . the nation's strength and security threatened. *Unthinkable?* Don't take paper for granted. Anything so vitally basic should be thought about . . . and safeguarded. Paper is essential! Use it wisely . . . protect its production . . . to keep America strong.

America depends on

PAPER

BELOIT IRON WORKS · PAPER MACHINERY · BELOIT, WIS. U.S.A.

PREPARED IN THE PUBLIC INTEREST BY BELOIT IRON WORKS, BELOIT, WIS.
MAKERS OF HIGH-SPEED, HIGH-PRODUCTION PAPER MACHINERY SINCE 1858

CAN YOU USE REPRINTS? This is one of a series of messages Beloit is running in Fortune Magazine to remind the U.S. of paper's importance. Reprints for bulletin boards and mailing available. Write to Beloit Iron Works, Beloit, Wis.

NEW ARKANSAS TRAVELER

HORTON DIGESTER heads for Crossett Paper Mills

Here is another example of Horton steel plate work ready to serve Industry. It's a Horton digester leaving our Birmingham, Alabama plant and heading for Crossett, Arkansas—and the Crossett Paper Mills.

This digester joins hundreds of other Horton steel plate structures serving the pulp and paper industry . . . an industry that annually spends millions of dollars on new equipment and machines. Such wide acceptance is the result of complete confidence in Horton equipment.

Our plant facilities for designing, fabricating and erecting steel plate structures are *complete*. We build tanks from non-corrosive metals or we can furnish corrosion-resistant linings whenever mill conditions require it. We have equipment for stress relieving and x-raying—and recently we have enlarged our facilities for pickling and painting by the Phoscote Process. This process is an excellent method of increasing the life of Horton structures.

Our four large plants—Birmingham, Chicago, Salt Lake City and Greenville, Pa., are strategically located to give all our many customers more efficient, more reliable service throughout the country.

So, whether you are modernizing your existing facilities or building an entirely new plant, consider the many unique advantages of Horton steel plate structures that mean finer performance. A partial list of equipment we build for paper and pulp mills includes . . . sulphate and sulphite digesters . . . diffusers . . . accumulators . . . Marx Savealls . . . pulp washing tanks . . . settling tanks . . . storage tanks. Write our nearest office for more complete information or quotations. There is no obligation.

This Horton digester, built for the Crossett Paper Mills, is 10 ft. 6 in. in dia. by 40 ft. 6 in. in length. The head and bottom shell plates are 2" thick. The structure has a working pressure of 150 lbs. per sq. in. at 650°F. It was carefully built to comply with ASME specifications, found in paragraph U-68. All seams have been ground flush.

CHICAGO BRIDGE & IRON COMPANY

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Birmingham, 1.....1511 North 50th Street
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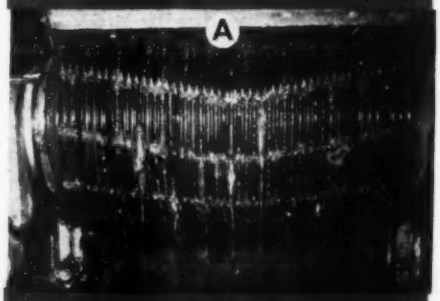
Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY, and GREENVILLE, PA. In Canada: HORTON STEEL WORKS, Limited, FORT ERIE, ONT.

NOW YOU CAN CONVERT BARK INTO PROFIT WITH THE VERSATILE FULTON ROLL PRESS

Actual photographs of FULTON ROLL PRESS in operation clearly show (A) large volume of water being expressed from wet bark; (B) discharge of bark after dewatering and reduction.



de-waters and *reduces* mill refuse to more efficient fuel or by-product . . . in one continuous, low-cost operation

With the FULTON ROLL PRESS, that pile of soggy bark, knots and screenings is quickly changed from a liability to an *asset*. This remarkable machine, perfected by the world's leading builder of sugar cane milling equipment after 99 years of experience, will:

• **DE-WATER** your bark, mill refuse and all kinds of fibrous material far more efficiently than conventional methods . . . convert them into more easily-processed by-products or money-saving fuel.

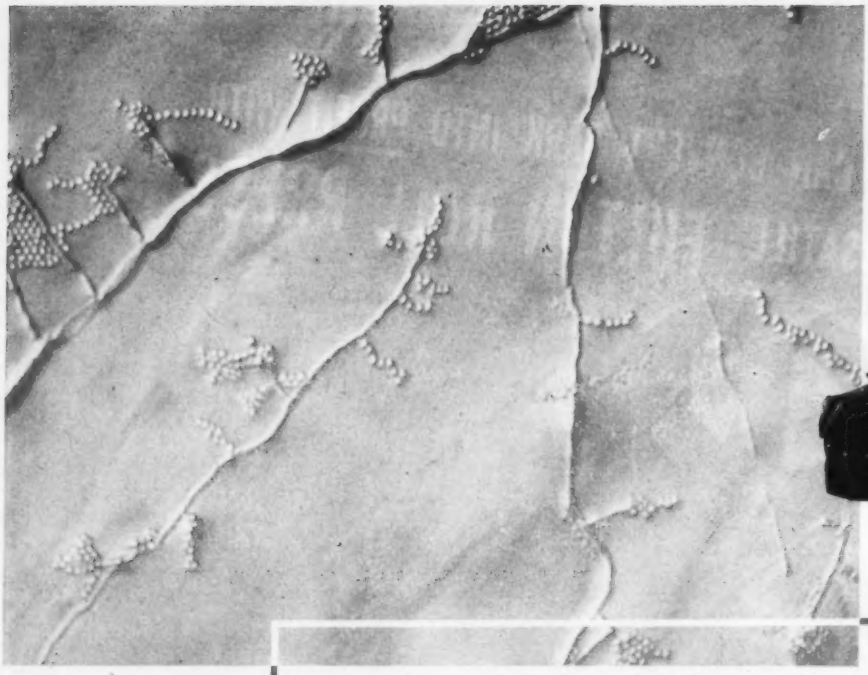
• **REDUCE** your knots and screenings for redigestion or refining . . . eliminating much of today's waste.

MAIL COUPON TODAY for full details and free test run of your material

Fulton Iron Works Company, *Dept. 651*
1259 Delaware Ave., St. Louis 14, Mo.
Please send full details of FULTON ROLL PRESS
☐ We are interested in FREE test run of.....
NAME.....
FIRM.....
ADDRESS.....
CITY.....ZONE.....STATE.....

FULTON

FULTON IRON WORKS COMPANY
SAINT LOUIS 14, MISSOURI



Left — Microphoto of Monilia (White), one of the slime-forming micro-organisms frequently found in paper mills and controlled by the Nalco System. Photos in Nalco Laboratories.

FORMULA FOR SUCCESSFUL SLIME CONTROL

SLIME control, like paper making itself, requires constant and careful attention to details. Here is a formula for successful slime control which will cut to a minimum, spots and specks, breaks, cleaning, and other costly problems due to slime:

- Identify slime-forming organisms to be controlled.
  A NALCO SERVICE
- Determine the best types of treatment to be used.
  A NALCO SERVICE
- Locate, by detailed survey, the proper points of application.
  A NALCO SERVICE
- Provide consistent supervision to check application and effectiveness of treatment.
  A NALCO SERVICE
- Maintenance of high standards of sanitation throughout the mill. (Even the best of treating and scientific control can be seriously hampered by unsanitary conditions.)

Nalco Field Representatives and the modern, scientific facilities of the Nalco Laboratories are at your service to put this formula for successful slime control into practical operation in your mill. Write for details today.

NATIONAL ALUMINATE CORPORATION

6232 W. 66th Place — Chicago 38, Illinois

Canadian inquiries should be addressed to Alchem Limited, Burlington, Ontario

THE nalco SYSTEM ... Serving the Paper Industry through Practical Applied Science

The Paper Industry

Technology • Engineering • Management • Production

VOLUME 33 • NUMBER 3 • JUNE, 1951

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THE PAPER INDUSTRY is indexed regularly in **Engineering Index** and **Industrial Arts Index.**

An index to each volume is issued annually by the publisher as a part of the April number. Copyright 1951 by Fritz Publications, Inc.

Published monthly by:
FRITZ PUBLICATIONS, INC.
Edward B. Fritz (1869-1939), Founder

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SEATTLE 4: **Nourse Associates,** Empire Building, Eliot 1769, (Arthur G. Neitz).

THE PAPER INDUSTRY—founded in 1919—known as "The Paper Industry and Paper World" from June, 1939, through December, 1949, assumed its original title with the January, 1950, issue.

Published at 404 North Wesley Avenue, Mount Morris, Illinois.

Address all correspondence intended for publication to Editorial and Executive Office, 431 South Dearborn Street, Chicago 5, Illinois.

Member: Audit Bureau of Circulation, The Associated Business Publications.

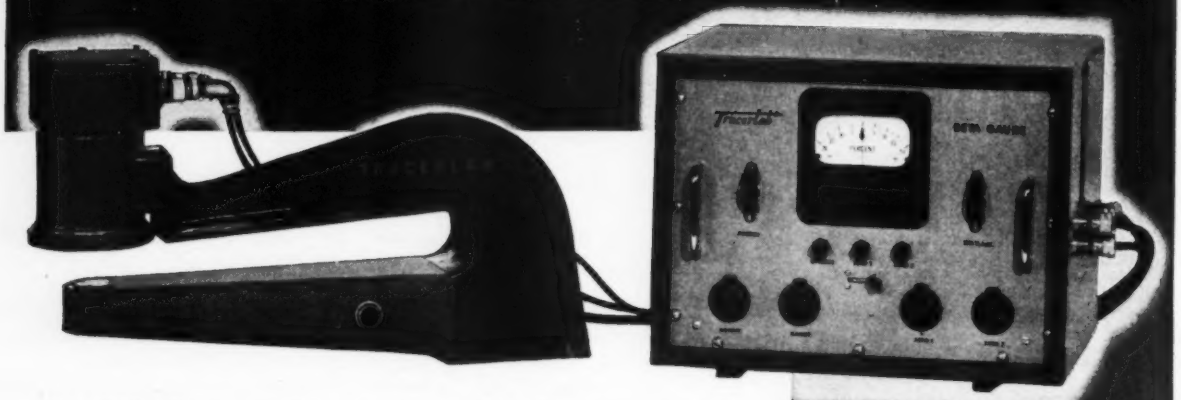
Entered as second class matter December 13, 1948, at the post office at Mount Morris, Illinois, under the Act of March 3, 1879.

Subscription rates: United States, U.S. Possessions, and Canada, $3.00 for one year, $5.00 for two years, $6.00 for three years. All other countries, $8.00 for one year, $18.00 for three years.

THICKNESS CONTROL A PROBLEM?

Tracerlab Beta Gauges

CUT COSTS—IMPROVE QUALITY



TRACERLAB's new model, non-contacting Beta Gauge measures and records the weight per unit area or thickness of sheet materials. Because beta radiation is used, a high degree of accuracy and sensitivity is achieved, unaffected by variations in chemical composition of the material being gauged.

Tracerlab developed the first Beta Gauges, and the experience gained through having these instruments in successful, everyday operation in a number of diversified process industries has now been incorporated in a new and outstanding gauge. Featured are simplicity of operation, ruggedness of design and reliability of operation — all combined in an instrument that maintains Tracerlab's established leadership.

The gauge's low cost will be rapidly repaid from raw material savings resulting from closer manufacturing tolerances and faster control, plus a greater uniformity of product with its resulting advantages. A meter showing percentage variation from normal, or a meter calibrated directly in weight or thickness, is standard equipment. Where a continuous record is desired, various types of recorders are available.

For non-contacting gauging of materials accessible only from one side, Tracerlab manufactures a model which operates by measuring "back scattered" beta particles. This gauge is particularly useful in gauging rubber, paper, plastics and other materials as they pass over a calender roll. It has also proved highly effective in measuring thickness of coatings on certain substances.

For complete information, write for Bulletin BG-PI.

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BETA GAUGES
are NOW gauging:

CARDBOARD
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PLASTICS
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PAPER
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ADHESIVE TAPE
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SHEET METAL
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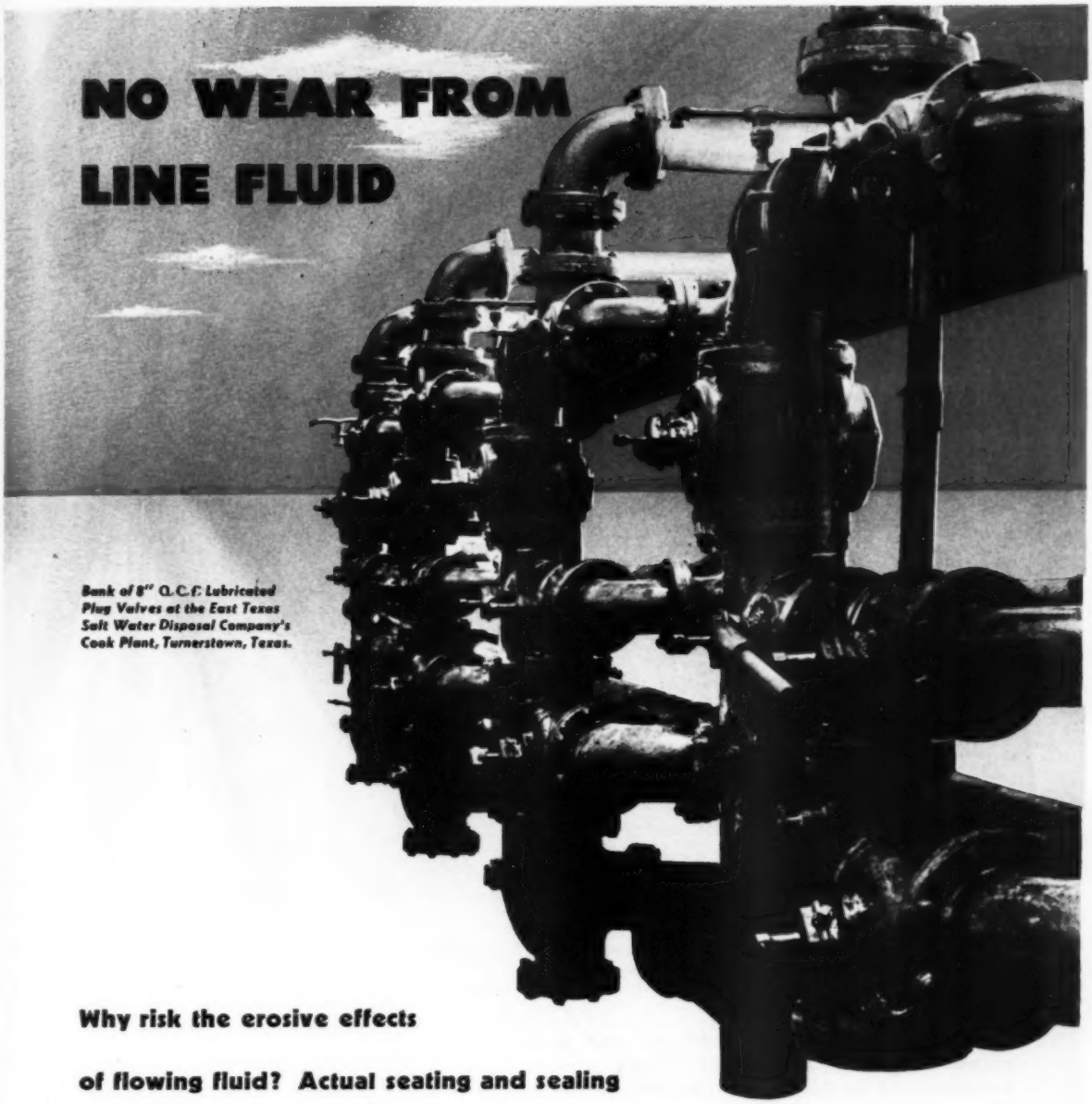
NO WEAR FROM LINE FLUID



Bank of 8" A.C.F. Lubricated Plug Valves at the East Texas Salt Water Disposal Company's Cook Plant, Turnerstown, Texas.

Why risk the erosive effects of flowing fluid? Actual seating and sealing surfaces of the A.C.F. Lubricated CYLINDRICAL PLUG Valve are sealed away and protected when the valve is on flow. The result is longer service life, no replacement of parts.

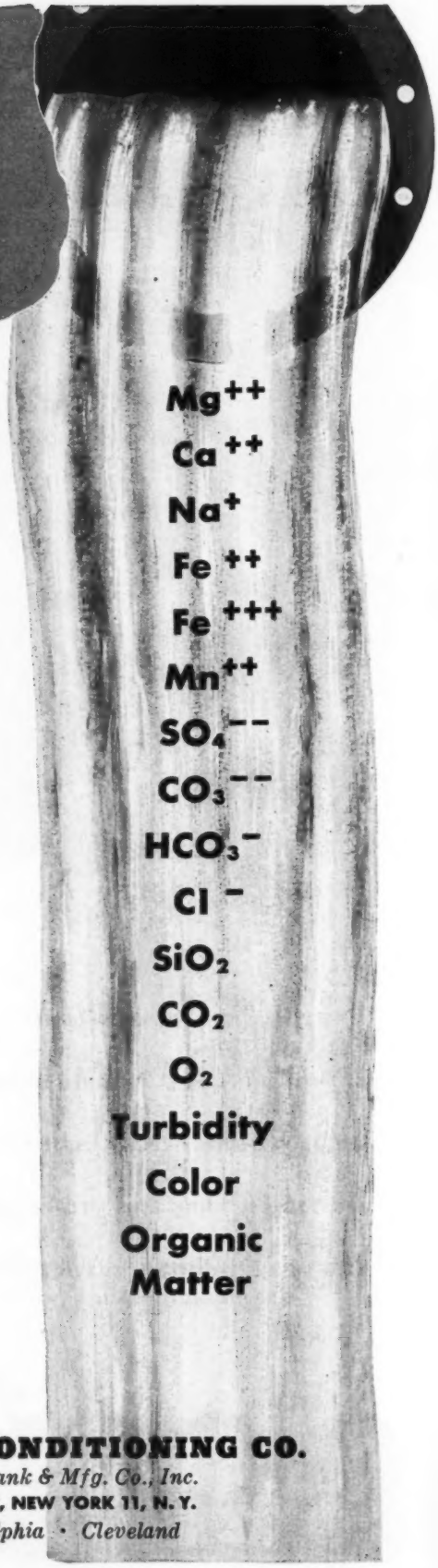
A.C.F. CYLINDRICAL FULL PIPE AREA **PLUG VALVES**

Representatives in 50 Principal Cities

Ask for Catalog 4-PI. American Car and Foundry Company, Valve Division, 1501 East Ferry Ave., Detroit 11, Michigan

GRAVER

can eliminate all these impurities from water...



Are any of these impurities causing plant shutdowns . . . equipment failures . . . high production costs?

Graver can eliminate any or all of these impurities from your water supply . . .

. . . because Graver manufactures *every type* of water treating equipment . . . hot and cold process softeners . . . cold and hot zeolite softeners . . . demineralizers . . . deaerating heaters . . . filters . . . chemical feeders . . . combination systems.

. . . because Graver brings complete research, laboratory, pilot plant, process development, equipment designing, manufacturing and erection facilities to bear on the solution of individual water-treatment problems.

. . . because Graver has a 40-year record of *pioneering* in the advance of water-treatment processes and the development and improvement of water-treating equipment.

. . . because Graver has many thousands of *successful installations* to prove the correctness of Graver recommendations and the effectiveness of Graver processes and equipment.

Graver provides authoritative advice on the most modern proven methods and designs for solving your particular water treating problem. Send sample of your raw water supply for *free analysis* and recommendations without obligation.

GRAVER

GRAVER WATER CONDITIONING CO.

Division of Graver Tank & Mfg. Co., Inc.

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GW 434

THE J-C HIGH DENSITY REFINER

RETAINS THE FIBER LENGTH WITH A MINIMUM OF FINES OR "THROUGH-FRACTION"

Note: curling of fibers effected by 0 15 refiner

USES: Defibering groundwood secondary screen rejects • Deshiving screened stock (groundwood)—chemical or semi-chemical • Defibering kraft and sulphite tailings • Will operate over a broad range of consistencies, but the specific power is exceptionally low at densities of 25% or higher • Self-cleaning—never plugs at any density • Has an inherently high capacity • Requires a minimum of floor space • Develops high mullen, tear and fold • Low in first cost and maintenance • Available in two sizes —with capacity of 25/50 tons/day or 75/150 tons/day • Used for introducing bleach solution uniformly into high density groundwood in the peroxide process • Develops appreciable curling as shown in photomicrograph above.

Manufacturers of the Zenith Continuous Pulp Press — Zenith Pulp Washer—High Density Refiner—Direct Heat Evaporator

J-C

A PRODUCT OF
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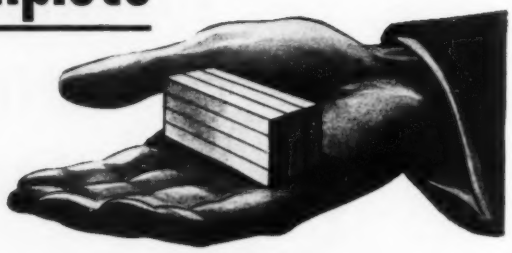
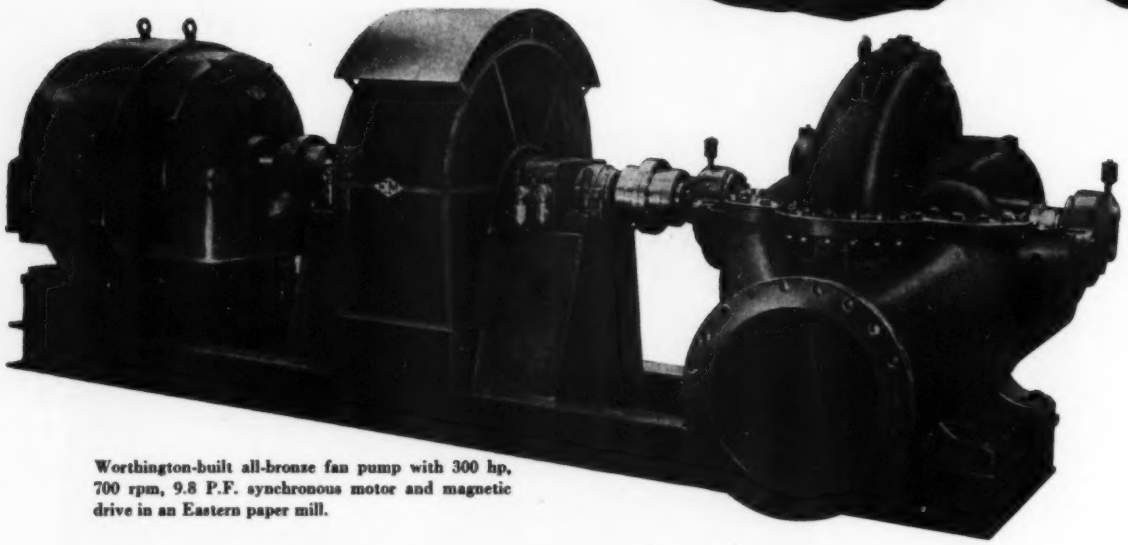
WORK WELL DONE SINCE '81

Not just a pump... a complete fan pump PACKAGE





Worthington-built all-bronze fan pump with 300 hp, 700 rpm, 9.8 P.F. synchronous motor and magnetic drive in an Eastern paper mill.

You get *more* when you have your fan pump requirements filled by Worthington because:

1. A specialized pump application division set up *exclusively* for the paper industry is put at your service.

2. The unequalled experience of Worthington engineers (we're the world's largest manufacturer of pumps) gives you the benefit of the very latest engineering.

3. Your pump will be built exactly to your particular requirements.

4. The pump, the motor and variable speed drive (magnetic) are integrated into a single unit matched to your job.

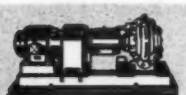
So . . . for proper matching of drive and load, lowest cost of power, and complete assurance of an accurate flow to the head box regardless of conditions encountered, turn the job over to Worthington.

As well as fan pumps up to 50,000 gpm, we make a complete range of special pumps for the paper industry. Whatever your pumping problem—send your maximum and minimum requirements to Worthington because *there's more worth in Worthington*. Worthington Pump and Machinery Corporation, Centrifugal Pump Division, Harrison, New Jersey.

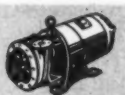
WORTHINGTON

C.1.8

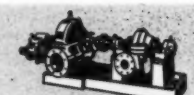
THE WORLD'S BROADEST LINE ASSURES YOU THE RIGHT PUMP FOR EVERY JOB



CENTRIFUGAL STOCK PUMPS
Type FP. Handle all kinds of stock up to 7% consistency. 4 sizes. Capacities up to 6000 gpm; heads up to 200 ft.



GENERAL PURPOSE PUMPS
Type DN. Single stage. Sizes 1 in. to 6 in. Capacities up to 2400 gpm; heads to 390 ft.



BOILER FEED PUMPS
Capacities up to 2000 gpm; pressures to 1250 psi.

For tubing satisfaction...

Are your condenser, evaporator, and heat-exchanger tubes of the best available analyses to meet the stepped-up conditions of current operation? For example, in handling sulfate pulping liquors, there is little or no difference in the service life of various stainless steels. However, in handling sulfite liquors, the use of stainless tubing of higher chromium content, including those containing molybdenum, give sufficiently increased service life to warrant, in most cases, their additional cost. If you aren't absolutely sure about your tubing requirements ask Mr. Tubes — your B&W Tube Co. representative — to step into your next retubing problem. He can advise on the seamless or welded tube best suited to give you an optimum cost-life ratio from the following B&W analyses:

Carbon Steel	Croloy 18-12 (Type 305)
*Nicloy 3½ (3¼-3¾% Nickel)	Croloy 16-13-3 (Type 316)
*Nicloy 5 (4¾-5¼% Nickel)	Croloy 18-13-3 (Type 317)
Croloy 18-8-S (Type 304)	Croloy 18 (Type 430)

*Available seamless only.

In addition to the grades listed above, B&W makes seamless and welded tubing in a wide range of other stainless and alloy steel grades. Send for new bulletin TB-328.

THE BABCOCK & WILCOX TUBE COMPANY

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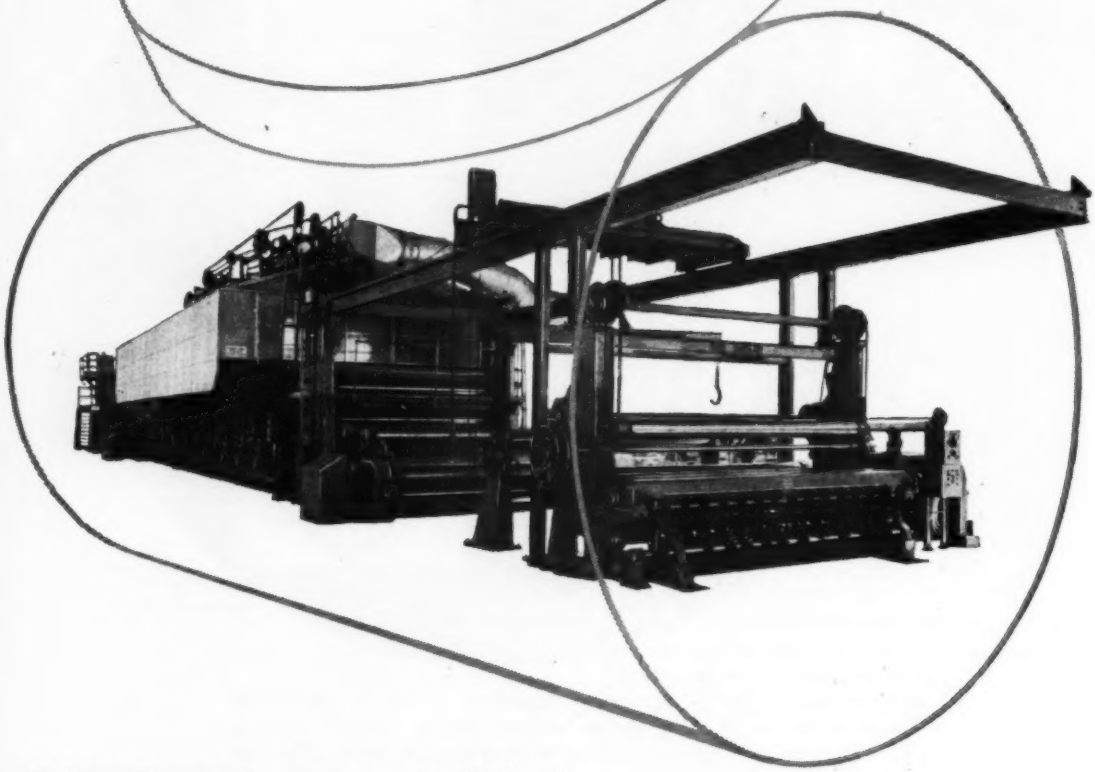
B&W SEAMLESS and WELDED TUBES

TA-1627-A

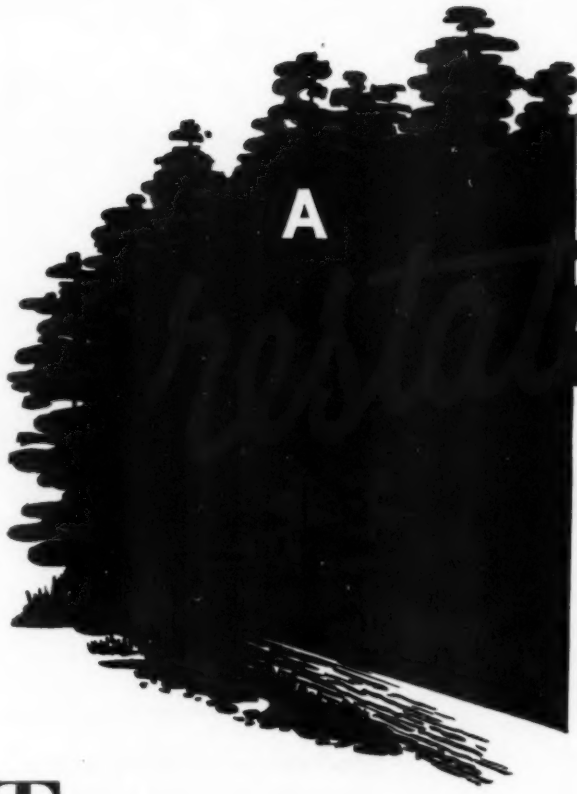
PAPER MACHINES *don't* COME IN CARTONS...



Each Rice Barton machine is engineered and built to do a specific job and to fit the requirements of space, location and production.

That's why Rice Barton machines have won so many friends in mills where costs, quantity and quality count.

Whether you make heavy board for cartons or the fussiest, thinnest paper for radio condensers, we would like to work out your problems with you. Please write:



A Statement OF THE WEYERHAEUSER OPERATING POLICIES

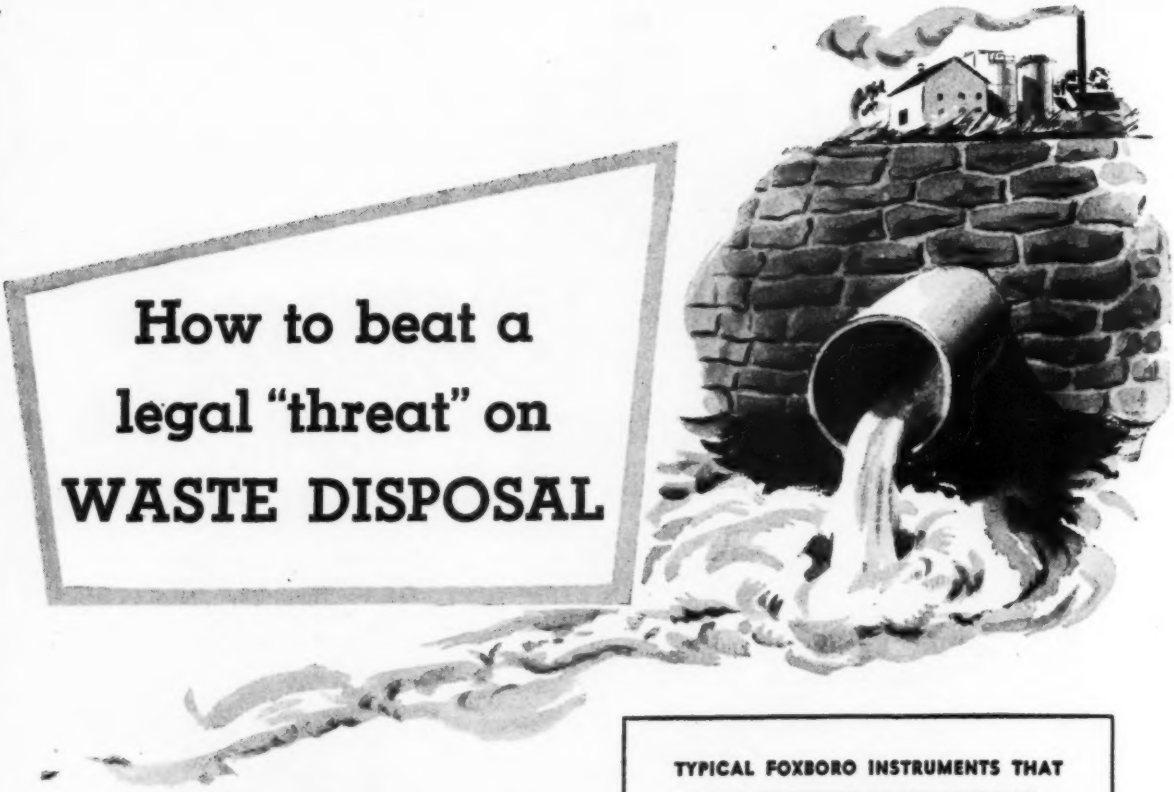
The Weyerhaeuser Timber Company is committed to the policy of operating its properties so that they will provide continuous and profitable employment for its workmen . . . and furnish uninterrupted supplies of forest products to the consuming public.

In brief, the basic policies which guide our forestry and mill management practices emphasize, first, recurrent forest yield by tree farming . . . which provides for the growing, protecting and harvesting of trees; secondly, whole crop utilization by grouping different kinds of mills on one mill site . . . which will permit processing all of every log at the mill for maximum use and dollar value.

Augmented by long range research and development programs, these practices will help establish a permanent forest industry . . . the continuous operation of our mills providing greater job security, a reasonable and necessary investment return, and achieving the ultimate objective of assuring quality forest products for use by our customers.

WEYERHAEUSER

How to beat a legal "threat" on WASTE DISPOSAL



. . . and cut fibre and chemical losses!

WITH STATE AFTER STATE now imposing legal restrictions on industrial waste disposal, you may be faced with this problem quite suddenly. Only by starting to gather complete data now can you be prepared for necessary action when that time comes. And the same data will reveal the extent of your fibre and chemical losses in plant waste. (The Foxboro waste-sampling system gives a continuous sample always in proportion to effluent rate—thereby assuring an accurate analysis.)

Foxboro has prepared a concise, informative bulletin on how to conduct a waste disposal survey. Based on specialized knowledge and long experience, this bulletin outlines the simple steps you can take to avoid hasty, last-minute plans. It shows how a careful, unhurried survey now can easily provide the facts on day-to-day quantities, concentrations, and constituents, so essential to efficient planning.

Send for a copy of "Waste Disposal Surveys".

Write The Foxboro Company, 1586 Neponset Ave., Foxboro, Mass., U. S. A.

TYPICAL FOXBORO INSTRUMENTS THAT LEAD TO BETTER WASTE DISPOSAL

The Model 40 . . . "The finest modern controller" . . . is the foundation of many outstanding Foxboro Waste Disposal Systems. It is used for the control of flow, pH, conductivity, temperature and other variables. Thousands are in use daily.

Foxboro Float and Cable Type Instruments are specifically designed for use on weirs and Parshall flumes. They read directly in *flow*.

FOXBORO
REG. U. S. PAT. OFF.

RECORDING · CONTROLLING · INDICATING
INSTRUMENTS

Appleton FELTS

for DESIGN *and*
FINISH-SERVICE-
DEPENDABILITY
and
UNIFORMITY

APPLETON
WOOLEN MILLS
APPLETON, WIS.

32nd Annual Convention

The American Pulp and Paper Mill Superintendents Association

June 24-28, 1951 • Hotel Multnomah • Portland, Oregon

June 24 — Registration and Affiliates Dinner

June 25 — Woods Trip

Busses to leave Multnomah Hotel about 7:30 A.M. Destination a few miles from Oregon Coast.

Cat-logging, high-line logging, falling, bucking and tree-topping operations to be witnessed.

Lunch served by Crown Zellerbach Corporation.

Afternoon trip through stands of western hemlock and Sitka spruce—also through area of famous Tillamook Burn (a forest area of 300,000 acres that was burned over during 1933).

Operations demonstration of tree thinning, reforestation, fire protection and prevention, and fire organization.

Arrive at Hotel Multnomah between 5 and 6 P.M.

June 26 — Mill Visits (Three Trips)

1. Crown Zellerbach Corporation, Camas, Washington.
2. Weyerhaeuser Timber Co., Pulp Division and Longview Fibre Co., both Longview, Washington.
3. Publishers' Paper Co., Oregon City, and Crown Zellerbach Corporation, West Linn, Oregon.

Dedication of historical marker at site of first paper mill in Oregon.

June 27-28 Two General Conferences *Six Group Meetings*

30 Papers on Operation, Maintenance, Technology, Forestry, Management

Practical—Informative—Authoritative

Unusual Ladies' Program

Educational—Social—Entertaining

President:
Charles E. Ackley
Crown Zellerbach Corp.
West Linn, Oregon

National Convention Manager:
Harry E. Weston
The American Pulp and Paper Mill
Superintendents Association
111 West Washington Street
Chicago 2, Illinois

Chairman:
Gus Ostenson
Crown Zellerbach Corp.
Camas, Washington

1951

Industry looks to Powell

for the latest improvements in

VALVES

That's because Powell never believes in "letting well enough alone," but is continually producing more advanced designs to meet the requirements of modern methods and processes.

Quality fine throughout "The Line"

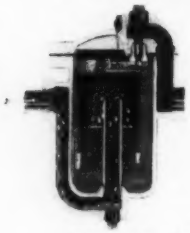
Small size flanged end O. S. & Y. Globe Valve for 150 pounds W.P. Available in various corrosion-resistant metals and alloys, with Stainless Steel bolts and nuts. These valves conform to all latest standards. Also available with screwed ends.

POWELL

The WM. POWELL CO., 2525 Spring Grove Ave., P. O. Box 106, Station B, Cincinnati 22, Ohio

ARMSTRONG PRODUCTS FOR BETTER PAPER MILL PERFORMANCE

SPECIAL TRAPS FOR DRYER DRAINAGE



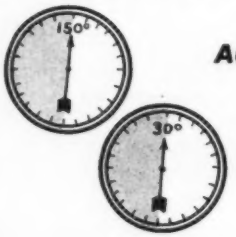
Better Performance,
Low First Cost,
Low Maintenance.

USE of an individual Armstrong trap on each paper machine dryer insures quick removal of condensate, air and incondensible gases at any pressure, provides higher operating temperatures. The cost is far less than for more elaborate systems and the special new Armstrong paper machine trap gives you long life with low maintenance. Quality is guaranteed.

BULLETIN NO. 205 ➧

. . . explains why you can depend on Armstrong paper machine trap performance. Send for a copy.

INDIVIDUAL DRYER TEMPERATURE CONTROL FOR PAPER MACHINES



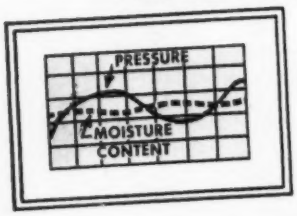
Automatically maintains dryer temperature at any point from 100°F to 250°F

THIS control mixes air with steam to maintain relatively cool wet end dryers. This prevents the sheet from sticking to the dryer surface and avoids curl or cockle due to overdrying on one side. The rest of the machine operates at maximum temperature.

BULLETIN NO. 187 ➧

. . . explains the Control and its advantages. Write for a free copy.

MOISTURE CONTROL SYSTEM FOR PAPER MACHINES



Automatically maintains very uniform sheet moisture content at any desired percent

THIS control maintains much more accurate sheet moisture content than is possible with hand control or constant steam pressure. It detects moisture content changes as the sheet passes over an "indicating dryer" and then varies steam pressure on the entire machine to compensate for the moisture variation.

BULLETIN NO. 196 ➧

. . . tells how the Moisture Control works, explains the specially designed components, lists the advantages. Send for your copy.

STEAM HUMIDIFIERS FOR PAPER STORAGE

Automatically adds moisture to maintain any desired relative humidity

ARMSTRONG Steam Humidifiers prevent the headaches caused by moisture loss from paper in storage; eliminate printing and converting problems. They connect into existing steam systems in much the same way as unit heaters, are economical, accurate, quiet, dripless. A size and type for every requirement.

BULLETIN NO. 1772 ➧

. . . discusses relative humidity, gives data and prices on Armstrong Humidifiers, explains hookups, selection, etc. Send for your copy.

ARMSTRONG MACHINE WORKS

816 Hoffman Street • Three Rivers, Michigan

BEFORE YOU BUY—

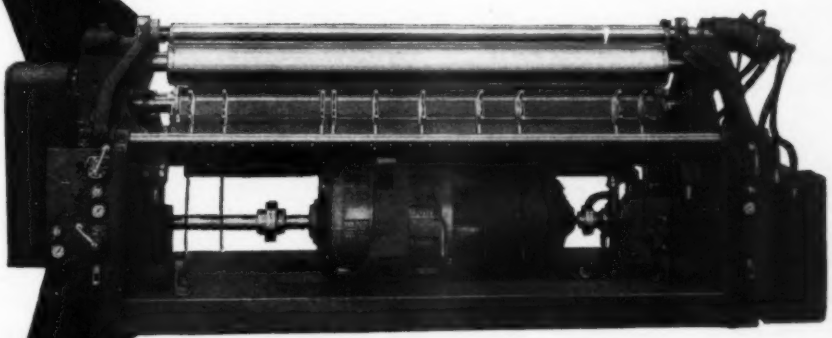
consider

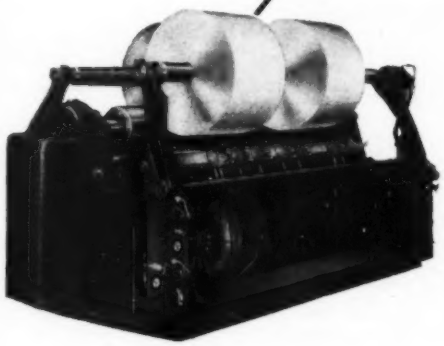
the new B & S

duplex REWINDER

OUTSTANDING FEATURES:

- Simplicity of design
- Variable-speed Drive
- High speed (up to 1500 ft. p.m.)
- Compact—saves space
- Vibrationless
- Hydraulically driven differential Rewind Shafts
- Air-Operated Slitters for strips as narrow as ½ inch
- Accurate pressure control between Drum and Rewind Shafts
- All hydraulic and air Piping enclosed in Frame
- All Controls easily accessible
- Ease of operation and maintenance
- Efficient and economical





The new B & S #15 Duplex Rewinder is powered by a Louis Allis Eddy Current Type Variable-speed Drive. A variable volume pump driven by an A. C. motor supplies power to the rewind shafts, and the winder is powered by the Eddy Clutch. By placing the entire drive beneath the machine, B & S designers have saved valuable floor space.

Accurate pressure control and precision winding are achieved by pneumatic cylinders for raising and lowering the rewind arms. For full center winding rewind shafts can be locked in "out" position.

To eliminate all possible vibration, the B & S Duplex Rewinder is mounted on heavy cast-iron bedplate. Fully enclosed piping and easily accessible controls assure smoothness and efficiency in operation, as well as ease and economy in upkeep.

For further details write to The Bagley & Sewall Company, 500 Fifth Avenue, New York 18, N. Y.

designers and builders of

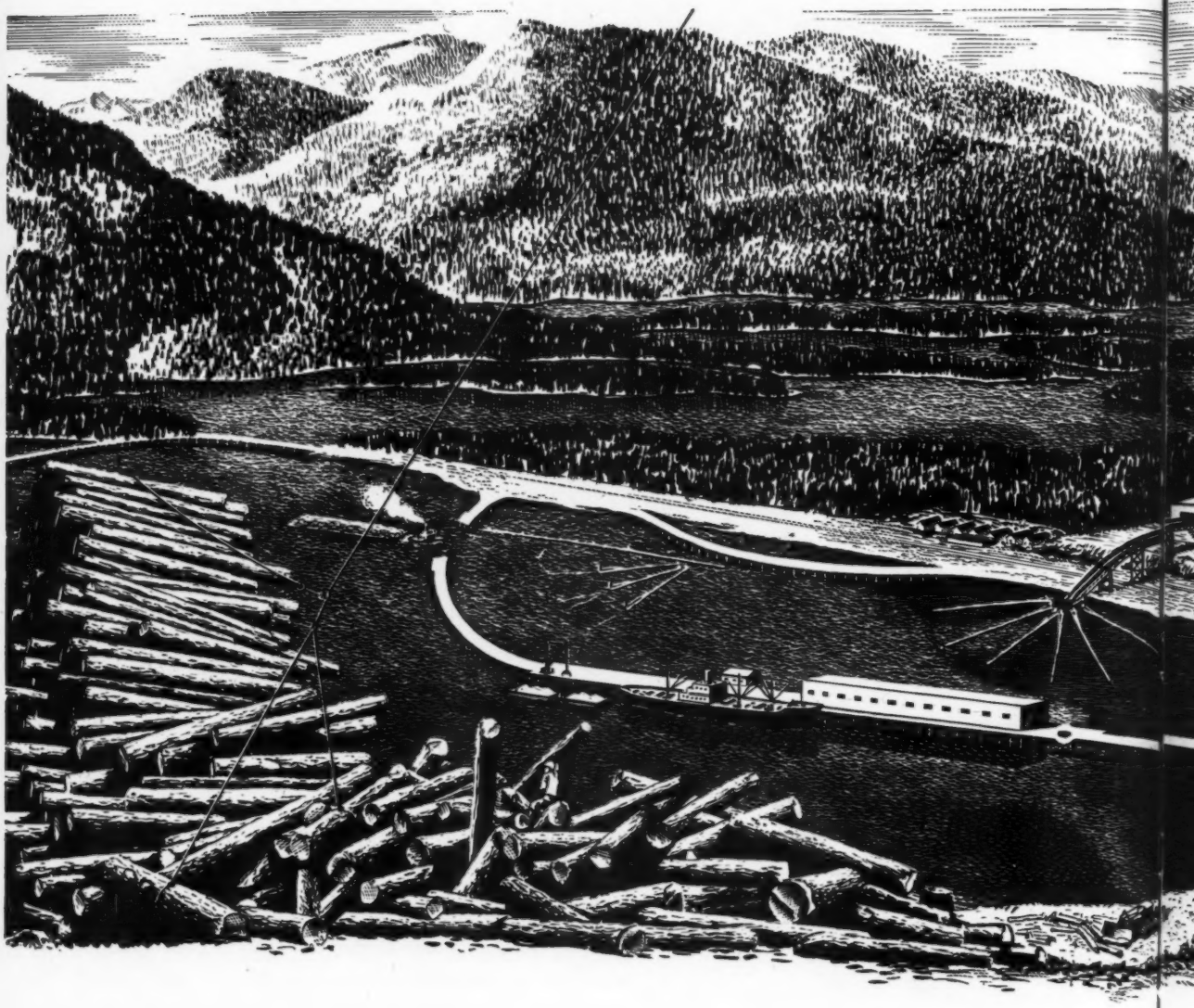
BAGLEY & SEWALL

WATERTOWN, NEW YORK

PAPERMAKING MACHINERY

SINCE 1853

500 FIFTH AVE., NEW YORK 18, N. Y.



"Farming" the Forests of the Canadian

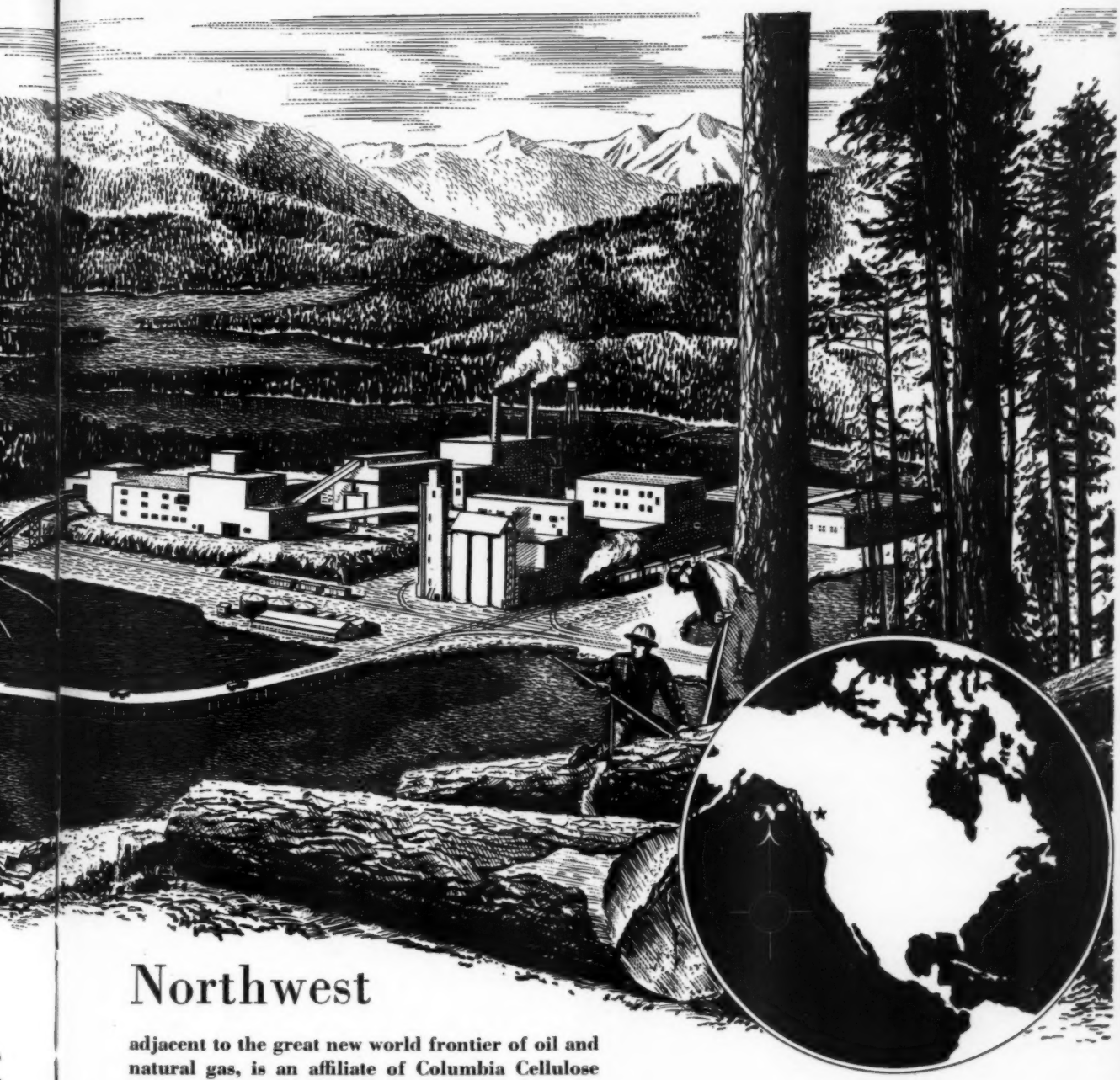
One of the basic raw materials vital to defense mobilization and military preparedness is purified cellulose, obtained from spruce and hemlock high-grade wood pulp. It is also a key raw material used in the manufacture of modern chemical textile yarns and plastics.

In an effort to assure an expanded and continuous supply of cellulose, Columbia Cellulose Company, Limited, was organized to pioneer an advanced project of "forest farming" in the Prince Rupert area of British Columbia, Canada. Forest Management License No. 1 was granted to the Company by the Province of British Columbia. Under this license, Columbia Cellulose and Provincial authorities have instituted a program of scientific logging and planned reforestation.

The orderly cutting and re-seeding of timber as a slow-growing farm crop, provides full utilization of natural resources, at the same time maintaining their productive capacity. This is conservation at its highest level.

The location of the new pulp plant at Prince Rupert, close to the forest areas, enables it to convert the timber into pulp with maximum efficiency. This mill provides a new and substantial source of high quality cellulose which will help relieve the present world-wide scarcity of wood pulp.

Operations of the Prince Rupert plant will contribute directly to the projected chemical plant operations of the newly organized Canadian Chemical Company, Limited, in Alberta. This company.



Northwest

adjacent to the great new world frontier of oil and natural gas, is an affiliate of Columbia Cellulose Company, Limited. Acetic acid from this plant will be combined with wood pulp from the Prince Rupert plant to produce cellulose acetate, the primary material used in the manufacture of acetate textile yarns and plastics.

These developments are an indication of the vast industrial growth taking place in Western Canada and the contribution it will make in securing the position of the entire Western World.

The planning behind an enterprise of this scope requires not only foresight and sound business judgment, but confidence as well. It is this kind of long-term planning that is responsible for Canada's great and growing industrial strength.

Columbia

CELLULOSE COMPANY, LIMITED

PRINCE RUPERT, B. C.

PERKINS HOLYOKE®

Perkins Calender Rolls—the natural result of the longest and broadest experience in the industry—give quality that is definitely reflected in your product. Perkins service includes refills of any make of calender rolls.

B. F. PERKINS & SON, Inc.

HOLYOKE, MASS., U.S.A.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

FOURDRINIER *Flexibility*

Downingtown Head Box and Slice are Adjustable to Meet Wide Range of Conditions

The design of the Downingtown Fourdrinier Head Box and Slice installed at Sonoco Products Co., Hartsville, S. C. is an example of the extreme flexibility which it is possible to build into a machine.

The stainless steel head box has a removable five-valve manifold inlet, and, because of its design the size and number of inlets are quickly changed when desired, without disturbing the head box itself. Adjustable partitions permit changing flow characteristics from inlet to slice to suit operating conditions. In addition, all parts are easily accessible for cleaning.

Interchangeable high and low speed slices are provided and are designed for machine speeds up to 1500 FPM. The low speed slice is used for machine speeds up to 250 FPM and above that the high speed slice is substituted.

These are a few of the adjustments which can be made in this most modern and versatile Fourdrinier. And what is vitally important, from an operating and maintenance standpoint, is that all adjustments are made by regular mill employees and do not require the services of highly trained engineers. This one factor alone prevents excess down-time and non-productive man hours of labor.

Write for this interesting bulletin: "Building Versatility into a Fourdrinier," which describes the complete machine in considerable detail.

DOWNINGTOWN MANUFACTURING COMPANY, DOWNINGTOWN, PA.

Pacific Coast Representative: John V. Roslund, Pacific Bldg., Portland 4, Oregon

DOWNINGTOWN STAINLESS STEEL FOURDRINIER

Built-in Versatility

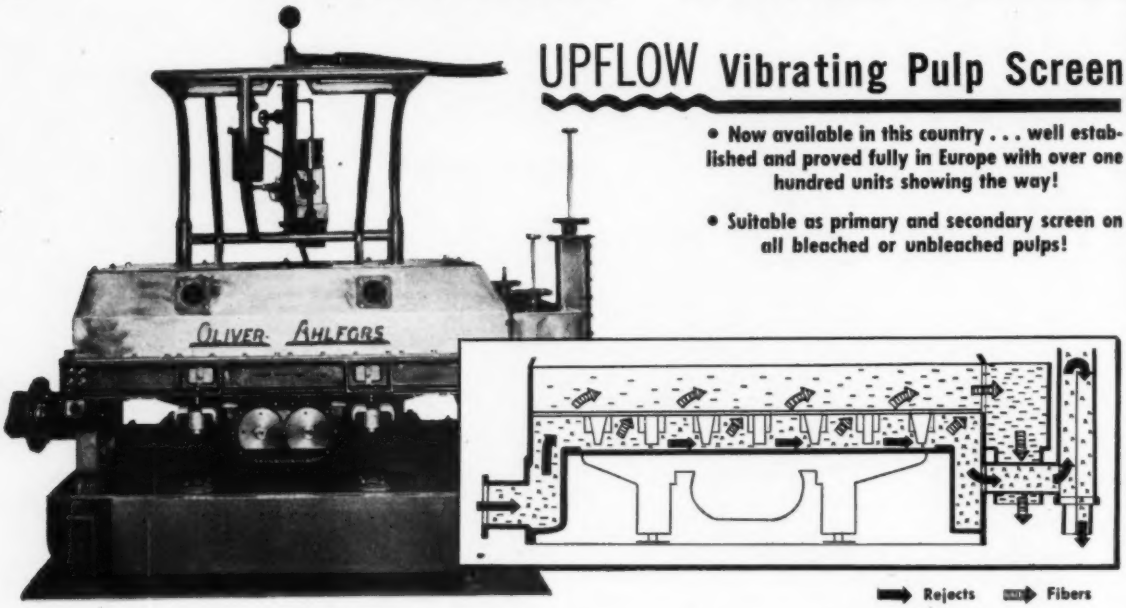
DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

Announcing!

OLIVER-AHLFORS

UPFLOW Vibrating Pulp Screen

- **Now available in this country . . . well established and proved fully in Europe with over one hundred units showing the way!**
- **Suitable as primary and secondary screen on all bleached or unbleached pulps!**



THE Oliver-Ahlfors Screen operates with an upward rather than downward flow of the pulp. This unique action provides the following advantages:

1 . . . high screening capacities because slotted plate screen doesn't clog.

2 . . . knots, dirt and other rejects drop down and away from the screening surface rather than onto it.

3 . . . fast, gentle, easily adjusted vibrations.

4 . . . rejects are constantly discharged at a controllable rate.

5 . . . can operate at much higher consistencies than normal flat screens; less power required.

6 . . . smaller floor area per ton handled.

These, briefly, are a few highlights of the Oliver-Ahlfors Screen of which the upward flow of pulp and the dropping away of rejects are the outstanding features. There are other advantages—operational and structural—very much worth studying. We'll be glad to send full information on request.

New York 18 — 33 W. 42nd St. Chicago 1 — 221 N. LaSalle St.
Oakland 1 — 2900 Glascock St. San Francisco 11 — 260 Calif. St.
Export Sales Office — New York • Cable — OLIUNIFILT

FACTORIES:
Hazleton, Pa.
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OLIVER UNITED FILTERS OUF INC. **inc.**

WORLD WIDE SALES, SERVICE AND MANUFACTURING FACILITIES

CANADA
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INDIA
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EUROPE & NORTH AFRICA
Dorr-Oliver S. A. Brussels
Dorr-Oliver S.N.a.R.L. Paris
Dorr g.m.b.h. Wiesbaden (16)
Dorr-Oliver Co., Ltd., London, S.W. 1
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Hobart Duff Pty., Ltd.
Melbourne

SOUTH AFRICA
E. L. Bateman
Johannesburg, Transvaal

NOW more important than ever to you

You are, or may soon be, shifting your production setup to meet the country's rearmament needs. New machines, new operations, and faster production schedules will demand some revision of your lubrication practices. That's why Standard's service-supply organization is now more important than ever to you.

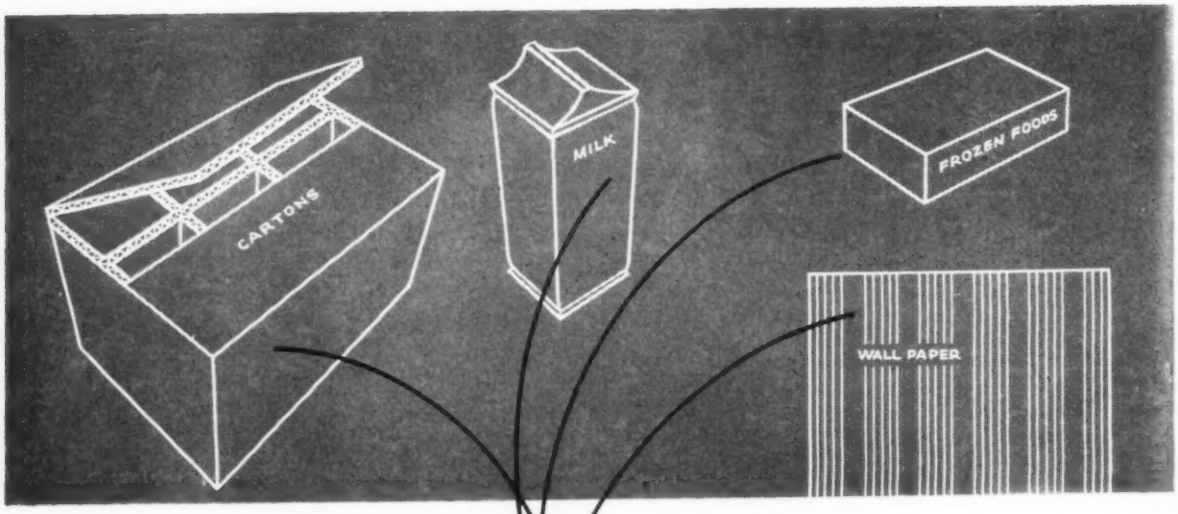
Standard has a service-supply warehouse within a short truck-hauling distance from your plant.

If you are a Standard Oil customer this warehouse will stock every lubricant used in your plant. Deliveries can be made in a few hours if necessary.

In addition, this service-supply center is headquarters for a Standard Oil lubrication specialist who is assigned to your plant. He is close at hand to give you help when you need it. He has plenty of practical experience. He has been specially trained for his job in a Standard Oil Lubrication Engineering School. He is backed by Standard Oil's extensive research and technical facilities.

To arrange for his visit, phone your nearby Standard Oil service-supply center or write to: Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL COMPANY (INDIANA) STANDARD



superior surface control in paper and paperboard surface sizing and coatings

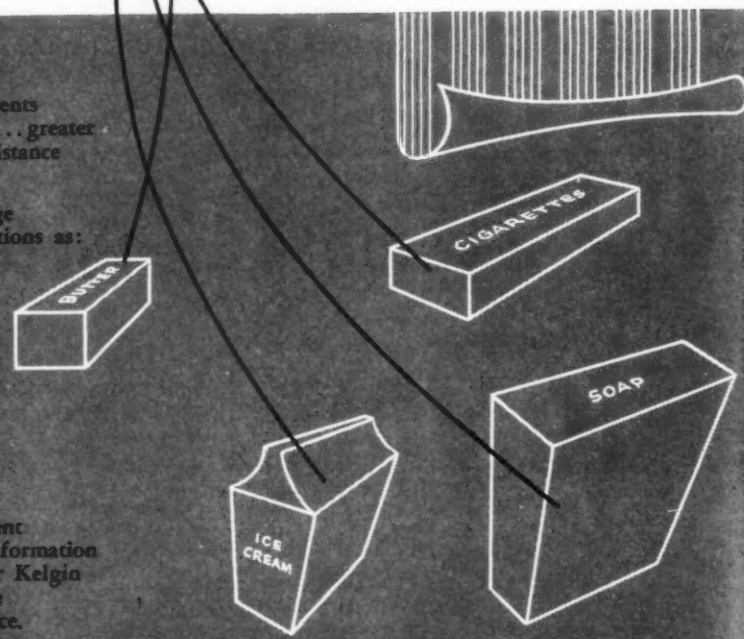
with kelsize or kelgin

These modern surface control agents assure uniformly smooth finish . . . greater surface density . . . better wax resistance . . . and improved printability.

Included within their wide range of adaptability are such applications as:

- Gloss Ink Paperboard
- Corrugated Board
- Milk Bottle Stock
- Butter Carton Stock
- Ice Cream Cartons
- Frozen Food Containers
- Soap and Cereal Cartons
- Wax Laminated Board
- Wallpaper
- Insulating Wallboard

Our Technical Service Department will gladly give you detailed information on the advantages of Kelsize or Kelgin in these and similar uses. Write or call our nearest regional office.



kelsize and kelgin

PRODUCTS OF KELCO

KELCO COMPANY

20 N. Wacker Drive, Chicago 6

31 Nassau St., New York 5

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Cable Address — Kelcoalgin-New York

n

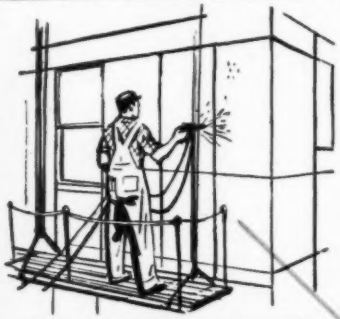
951

WE LIVE—

WE BREATHE—

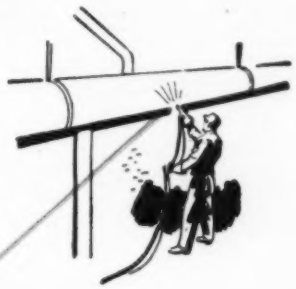
WE THINK—

Coatings



Gilsonite Insul-Mastic—The only mastic coating ever approved under original U. S. specifications for the preservation of bombers and war materiel. Moisture vapor transmission rate of only .01 grams per 24 hours per 100 square inches per ⅛" thickness by actual government test.

The only business of the Insul-Mastic Corporation of America is the manufacturing of the best coatings possible to formulate. Our entire research and development is concentrated solely upon the production of better coatings. We have no other lines to divert us from this one aim—which is one of the many reasons why we excel in:



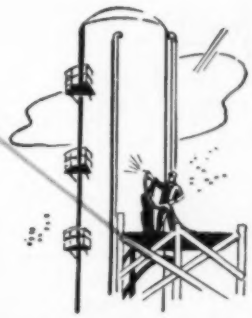
Insul-Mastic Vinyl System—Flexible for use over rigid and semi-rigid insulation. Provides a tough resilient moisture barrier to protect thermal insulation. Eliminates use of chicken wire and asbestos cement.

- CORROSION PREVENTION
- MOISTURE SEALING
- VAPOR SEALING
- INSULATION

Insul-Mastic Type "D"—Sprayed insulation. Adheres at any angle. Stops 65% of heat loss. Water repellent.

Insul-Mastic coatings are homogenized. The solvents do not separate. The smooth homogenized texture throughout assures you of easy pumping and definitely helps sprayman to avoid blobs and pinholes.

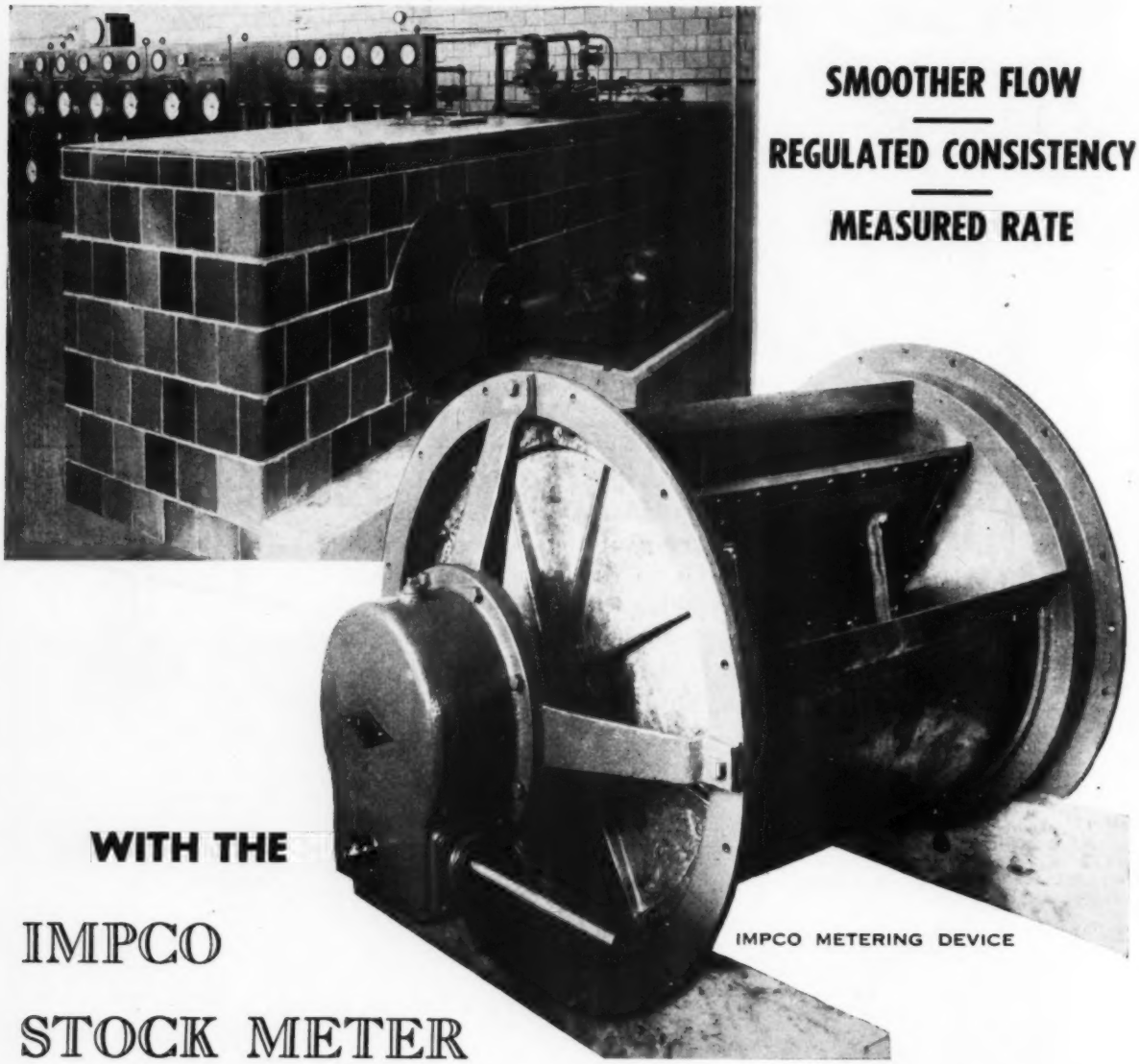
think first of the coatings that last!



Gilsonite Insul-Mastic—Highly resistant to acids, alkalis, moisture and wear. Exceptionally long life.

Insul-Mastic Corporation
OF AMERICA
1157 OLIVER BUILDING · PITTSBURGH 22, PA.
Representatives in Principal Cities

INCREASED CAPACITY---



SMOOTHER FLOW

REGULATED CONSISTENCY

MEASURED RATE

WITH THE

IMPCO STOCK METER

IMPCO METERING DEVICE

Most pulp and paper making equipment is rated conservatively so that it has a margin of capacity to absorb peak loads either of capacity or of consistency. If a machine can be operated at a steady rate well up towards its peak, up to 30% extra capacity may be obtained without penalizing performance.

The "Impco" Stock Meter is an adjustable volumetric measuring device which enables you to realize this extra capacity from your equipment. Preceded by a consistency regulator, it gives a fixed flow of a regulated consistency and thus uniform tonnage control. Adaptable to tile, metal, concrete or wood vats.

IMPROVED PAPER MACHINERY CORPORATION

NASHUA · NEW HAMPSHIRE

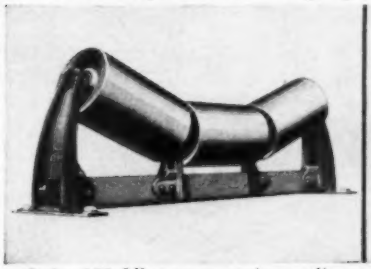
Sherbrooke Machineries Limited manufacture similar equipment in Canada

LINK-BELT engineering experience...

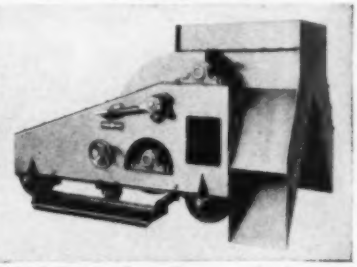
Plus

LINK-BELT quality components...

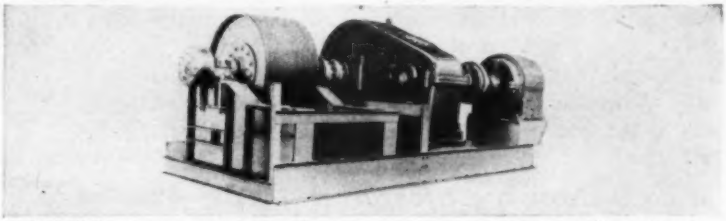
The pulp division of a large timber company uses this 36-inch Link-Belt belt conveyor with 45° troughing idlers for carrying chips to digester.



Series 100 Idlers are superior quality, with high-grade roller bearings and effective grease-in-dirt-out seal.



Link-Belt makes all types of trippers for discharging materials and distributing them along the conveyor belt.



Link-Belt power transmission equipment meets every conveyor need. Shown here: Link-Belt 300 H.P. fluid coupling drive and D-250 herringbone gear reducer.

...add up to your best buy in BELT CONVEYORS

YES, you get *both*—practical engineering and quality components—when you call on Link-Belt for belt conveyors! Thousands agree Link-Belt makes the finest belt conveyors on the market today.

Engineering experience? Our conveyor specialists draw on an accumulation of years of materials handling and power transmission experience. They will help you and your consultants get top performance from a modern conveying system.

Quality components? We design every item on a belt conveyor system and build it to the highest standards. We make all types and sizes of idlers, take-ups, pulleys, trippers, bearings, drives and supports. You get the *right* equipment for your exact requirements when you rely on Link-Belt.

See for yourself! Let us show you some of the modern conveying systems we have installed. See the results of practical Link-Belt engineering experience—simplicity of design, the finest components, and most important, *top performance.*

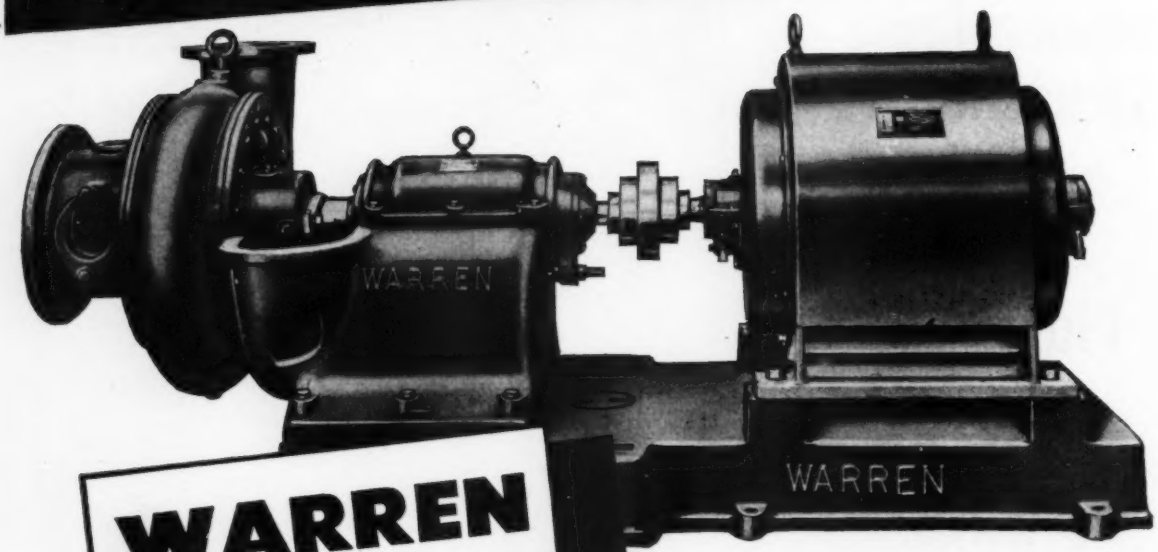
Remember, there's a Link-Belt conveying specialist in the branch office near you. Call him for complete engineering information.

LINK-BELT

BELT CONVEYOR EQUIPMENT 12,301-D

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

Engineered for Efficiency–Built for Dependability!



WARREN TYPE "L" PUMPS

....for process industries*

Excellence of performance in hundreds of installations stands as positive proof of the top flight efficiency of the Warren Type "L" Pump . . . more than fifty years of experience and constant research stand in back of the modern hydraulic principles embodied in its design.

Note these features:

ADJUSTING SCREW—Reduces clearance caused by inevitable wear between open impeller and suction liner—lengthens the periods between replacement of liners.

EXTRA HEAVY SHAFT—Provides high factor of safety, withstanding heavy duty. Shaft sleeve provides protection from wear at stuffing box.

STURDY BEARING PEDESTAL—Withstands heaviest service.

LARGE SUCTION AND IMPELLER EYE OPENINGS—Make it possible to handle heavy consistencies with less danger of plugging or cavitation.

STUFFING BOX—Extra deep—arranged for water cooling, if required. Seal ring provides for external sealing.

SPACER TYPE COUPLING—Allows adjustment for wear . . . permits easy removal of rotor without disturbing motor.

HEAVY CASING—Heavy metal sections assure long service . . . casings can be rotated on cradle.

RENEWABLE LINERS—Protect casing—easily renewed without disturbing piping or motor.

DIFFERENT TYPES OF OPEN IMPELLERS—Available for variety of services. Eductor vanes help keep foreign particles away from packing and sleeve.

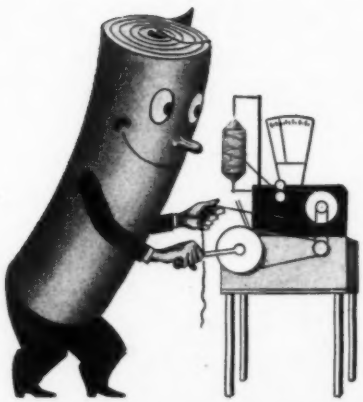
Ask for Bulletin 245 showing the complete line of Warren Liquor Pumps

**For pumping hot or cold acids, alkalis, chlorine, digester liquors, juices and other corrosive liquids; and paper stock, cane juice, and similar erosive matter; in such industries as: Pulp and Paper, Sugar, Coal, Breweries, Distilleries, Perfume, Plastics, Chemical, Food, Starch, Synthetics, Flavoring, Nitrogen, Petroleum, Paint and Varnish, Vegetable Oils, Soap, etc., etc.*

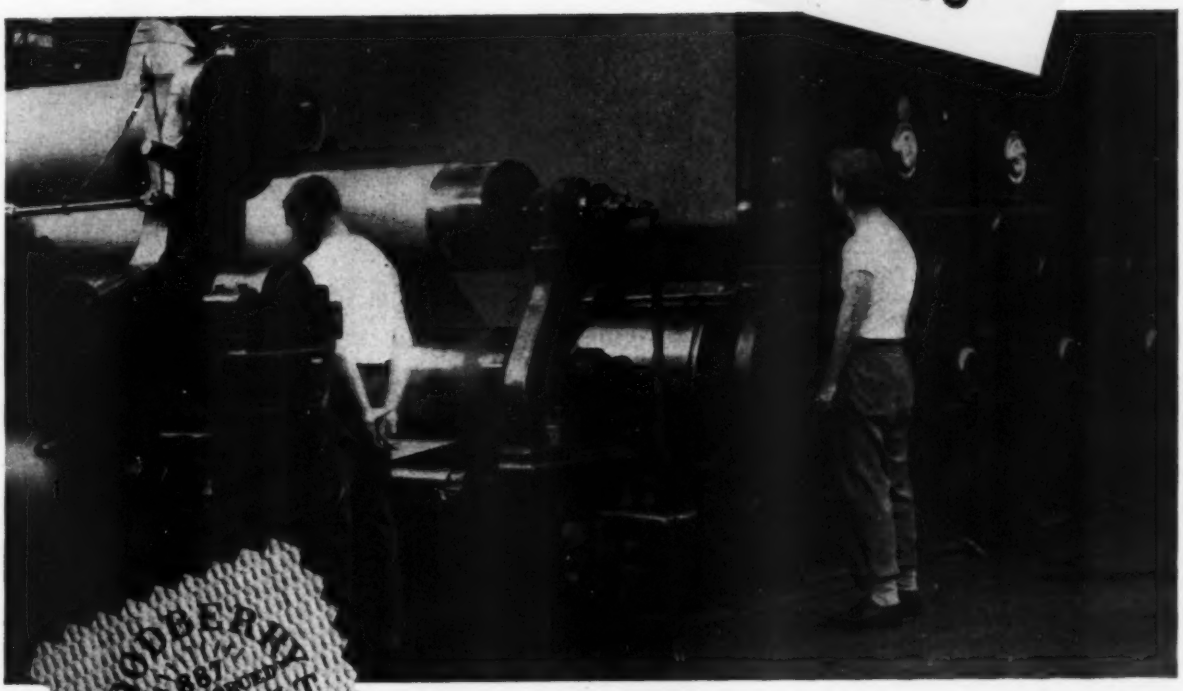
PP-15

WARREN PUMPS

WARREN STEAM PUMP COMPANY, INC., WARREN, MASSACHUSETTS



SCIENTIFIC CONSTRUCTION
Makes the Big Difference in DRYER FELTS



Gives You Scientific Construction

Asbestos yarns woven at scientifically determined intervals into the face of Woodberry 887 heavy duty dryer felts means longer wear, lower steam consumption, increased porosity, finer paper quality.

AT YOUR SERVICE

Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.

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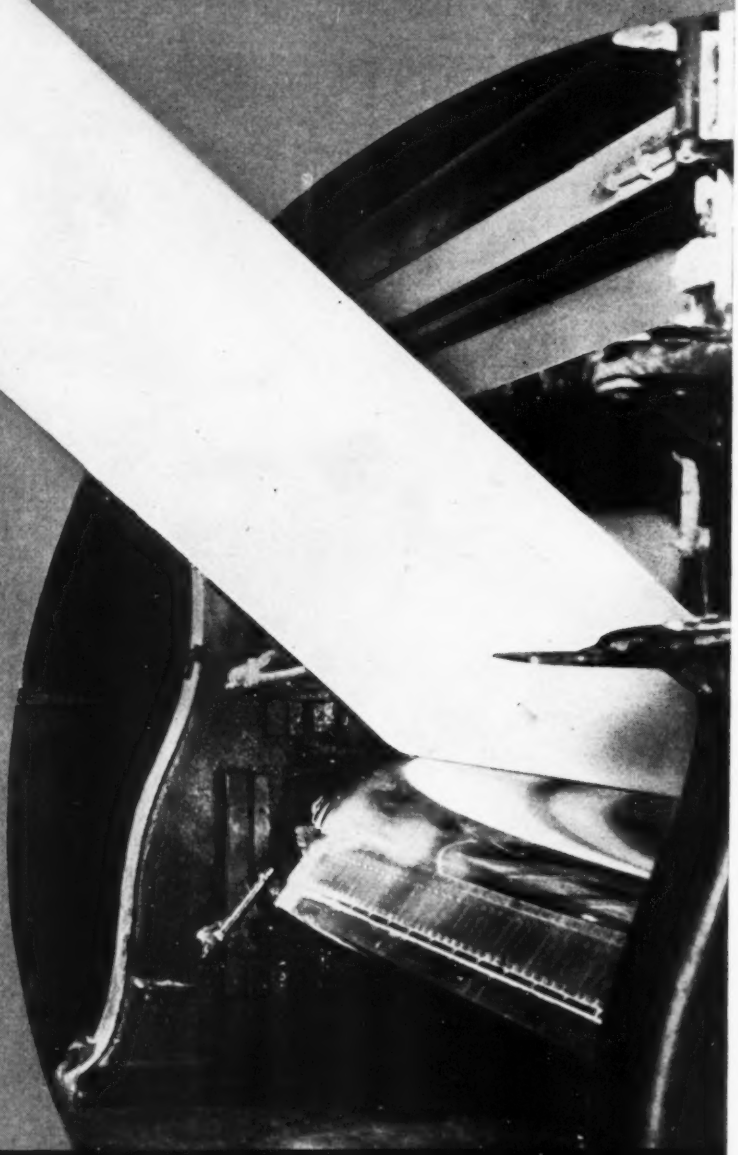
CHECKING COEFFICIENT OF VARIATION And Average Factor Of Quality On Evenness In Roving With Beiger Tester. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

VICKERY DOCTORED ROLLS

Help Make More Paper



Vickery Doctors are engineered to keep papermaking rolls clean and shining.

Clean, shining rolls help keep the paper machine going at top speed—reduce rejects and breaks.

As a practical, inexpensive measure for maximum output, check the condition of your roll surfaces; then ask for layouts and estimates on Vickery Doctors whenever needed.

BIRD MACHINE COMPANY

SOUTH WALPOLE • MASSACHUSETTS

The Paper Industry

June 1951

Westward Ho!

West Coast hospitality, well-known to many papermakers and "peddlers," will be enjoyed again late this month when the American Pulp and Paper Mill Superintendents Association holds its annual meeting at the Multnomah Hotel in Portland, Oregon. An outstanding program of technical papers is reward enough for even those who must travel from the far corners of the country but the real benefit, as is the case with most industry meetings, comes from personal contact with pulp and paper makers where common problems can be discussed in casual off-the-record conversation. It's here that we find somebody else's slant on our own practical problems; sometimes we're able to uncover just the idea we need to clear up our troubles.

We can't mention the Pacific Northwest without thinking of the field trips to mills and logging camps which show off the characteristically unique operations in the land of big timber. Even those whose homes are in the west will welcome the opportunity to see the high climbers in action, high lead logging, and other phases of timber harvesting operations. There will be ample opportunity for visitors to observe modern tree farming, reforestation methods and other conservation measures practiced on a large scale in this area.

It's hardly necessary to draw attention to the scenic beauty for which the West is noted. Delegates from the midwest and east, whether they come on the special train or by any other means, will have ample opportunity for sight-seeing while crossing the Rocky Mountains and the Cascade range even before they get to the Coast. The "Superintendents' Special," run by Great Northern, will stop for a day's outing in Glacier National Park en route as an added attraction. It's still not too late to make reservations—see you in Portland!

Education and Research

Two conferences, held last month in Wisconsin, are worthy of note since they indicate an intelligent approach to some basic problems.

At Appleton, training men for the paper industry was the theme of the fifteenth Annual Executives' Conference of the Institute of Paper Chemistry, wherein panel discussions by staff members and students outlined this number one function of the Institute. While the Institute serves its members and the whole industry in a variety of ways, by investigating specific applied research problems, by carrying on projects of a fundamental nature, and by disseminating a wide variety of information, its basic function is that of education. By re-emphasizing its education and training program and by outlining the methods by which selected students in this program progress, the Institute indicated its awareness of the current and future shortage of well-trained men who must one day fill the management ranks of our industry.

At Madison, the APPA Committee for the Coordination of Research met to discuss wood utilization progress. Included in the program were interesting and informative papers on ammonium sulphite pulping and other pulping processes. More significant, however, were several papers by members of the Forest Products Laboratory staff which outlined some of the fundamental research in wood chemistry now being carried on. By studying the fundamental chemical reactions of the various components of wood during pulping and bleaching processes, we may learn the "why" as well as the "how" of these reactions. A better understanding of the kinetics of pulping reactions will certainly help put our industry on a scientific basis and permit us to depart from the empirical methods generally employed. The positive scientific approach by the Forest Products Laboratory toward achieving a fundamental understanding of basic processes is a hopeful sign and is strongly commended.

Imagine America Without Paper!

That's the title of Beloit's ad in the June issue of *Fortune*. It's the start of a campaign by this leading paper machine builder to point up the essentiality of paper and paper products in the daily lives of the American people.

Writes Harry Moore, Beloit vice president, ". . . We feel that the time is right for the paper industry to let the nation know the vital importance of paper. If the industry will only speak up now, it will have a good chance of getting fair treatment under present and future emergency conditions. We know that we cannot carry the full load of publicizing the paper industry, but we hope this series of Beloit ads in *Fortune* and the trade magazines will stir up enough interest so that the paper industry will want to work out an industry-wide national advertising program for itself . . ."

The above message speaks for itself. Let's all put our shoulders to the wheel!

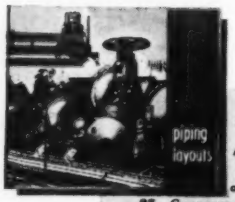
ANOTHER NOTABLE ACHIEVEMENT IN SERVICE LITERATURE BY JENKINS

THE NEW

BOOK No. 2

Nos. 26—50

practical piping layouts



The second series of twenty-five basic Piping Layouts (published by Jenkins Bros. in leading industrial, professional, and engineering publications) is now available in booklet form.

If you are among the hundreds of valve-users who received a copy of the first book, or if you saved any of the fifty Jenkins Piping Layouts as they appeared, then you know how helpful this information can be in planning any valve installations.

This new book brings you not only 25 practical piping layouts, arranged in convenient form for quick reference. It also includes a section on the fundamentals of valve design and application to help you select the type of valves best suited for the service.

Use it as a guide to proper valve selection and placement for longest service life and lowest operating costs. Use it also for an introduction to the wide range of Jenkins Valves for every industrial engineering and plumbing-heating service. You can obtain a copy by requesting it on your business letterhead. Address:

Dept. O, Jenkins Bros., 100 Park Ave., New York 17, N. Y.

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JENKINS VALVES

LOOK FOR THE DIAMOND MARK

SINCE 1864 TRADE JENKINS MARK

Jenkins Bros.

Sold through leading industrial distributors everywhere

THIS SECTION DOUBLES ITS VALUE TO YOU!

Tells "Which valve where, and why"—with information in chart form for quick reference. A compact manual that will be prized by everyone, beginner and veteran alike, who plans piping.

The Paper Industry Current Comment

A year of controls . . . . more to come

Survival and service now take the spotlight . . . profit-making forced offstage

WITH THE EXTENSION of the War Defense legislation soon to come before Congress, either in the form of amendment or a differently phrased law, opinions differ on whether the stabilization program after a year of existence has accomplished anything of real moment. Opinions differ as to whether the NPA and OPS are an improvement over the controls during World War II. A fair analysis might be that the program is functioning better than the old system in the quality of industry participants who are giving their talents to an effort to accomplish real results, but that the motivation back of the program evidences a continued socialistic trend in the minds of Administration planners.

One thing is certain, and that is that the use of a profit basis as a pedestal on which to compute prices is a far cry from American economic precedents, by which this nation became the most prosperous in the world, by giving the American a chance to hoist himself into financial independence.

Another thing is certain, the mass of reports demanded by Washington agencies is engulfing the American business man. The avalanche, called for monthly or quarterly or both, swamps the average employer. An example is the price regulation calling for retail pricing charts. In the New York area alone retailers have sent in only ten per cent of the 45,000 charts called for.

Regulations now present chaotic picture

The mass of regulations being issued is staggering, and the difficulty in interpreting them is beyond the grasp of average men who try to balance off their costs against reasonable pricing and justified profits. A simple illustration points up this situation. A pricing regulation covering the method of computing price ceilings for pulpwood in the Northeastern States, comprised nearly thirty pages of fine printed text.

The surrender of the Administration to labor's blackmail under which the Wage Stabilization Board is given authority to settle wage disputes is under investigation in Congress. The Senate Labor Committee investigation is in charge of a senator who sees things labor's way. The House Committee, on the contrary, is conducting its investigation under the supervision of a champion of the Taft-Hartley law. The President has named the new Wage Stabilization Board of seventeen members, including eight of the members of the old board among whom is Rueben B. Robertson, Jr., president of Champion Paper and Fibre Co., representing industry. An additional industry member is Alexander R. Heron, director of industrial relations for the Crown Zellerbach Co.

The complexities of the paper problem involving defense production and prices in the paper field is making Washington commuters of many of the industry leaders. Advisory committee meetings representing various groups, as well as over-all committees, are constantly being scheduled, with task groups formed to handle special problems. One suggestion which has come from these meetings is that self-contained paper mills be required to hold three per cent of their pulp production as a reserve for the use of the converter paper mills. Basis weight restriction is another item which may develop into a formal regulation.

There is no question of the individual honesty of the top men who have been named as heads of the control systems. The planners behind the operating units, the Administration economists, however, seem to be dictating programs which are at least subject to question. And the whole control system aside from the industrial experts who have been called in as section chiefs, is honeycombed with lame duck politicians.

Negotiations on Reciprocal Trade are completed

The long-awaited outcome of the Torquay Reciprocal Trade Agreement negotiations has at last been announced, and the paper industry suffered a minimum of rate reduction. Originally, printing paper, both book and groundwood, as well as plain paperboards, were scheduled for potential rate reductions. The present rates on these grades, however, were left unchanged, and the only material reductions announced were on shoe boards, cigarette paper and pulpboard for use in the production of wallboard. Two factors affected this result. First, the United Kingdom refused to modify its Empire Preference system, so no agreement was reached on any paper items in which the United Kingdom might have benefited. The other element is the fact that paper has been the commodity most subjected to previous duty rate reductions, and was the lowest, in rates of duty, of any major commodity. Other industries, by the Torquay negotiations, were subjected to approximately the same reductions that previously had been applied to paper. Canada placed book paper for use in publications enjoying second class mail privileges on the free list.

In the Torquay negotiations, the United States granted tariff rate reductions on more than 1,250 commodities, and nearly 500 were the maximum permitted by law. Out of these reductions, 67 previously had been reduced to half the rate fixed by the Tariff Act, and were thus brought down to one quarter of the rate formerly in effect. Today the United States is nearer to a free trade basis than any other nation, the United Kingdom, formerly a free trade power, now being converted to the theory of the need for tariff protection to its industries. Broadly, The United

Two Rugged STOCK PUMPS FOR THE PAPER INDUSTRY

Designed for lasting service

TOUGH, DEPENDABLE CENTRIFUGAL PUMP

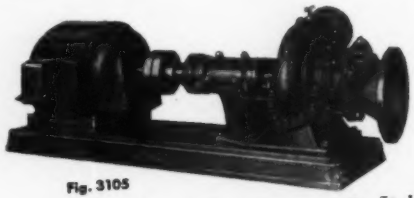


Fig. 3105

This pump is specially designed to handle paper stock. It is ruggedly built to give long, trouble-free service. The following desirable features are incorporated in all sizes:

- **Horizontal discharge to prevent air binding**
- **Renewable wearing parts**
- **Adjustable axial clearance between rotating and stationary parts**
- **Backwall ejector vanes on impeller to prevent binding of stock behind the impeller and also give hydraulic thrust balance**
- **Various size suction pieces available. Each has large hand hole for easy cleaning**

This heavy duty, open impeller model pump will deliver 250 to 4000 G.P.M. at heads up to 220 ft. Available in sizes 4″, 6″, and 8″.

DURABLE, VERTICAL CENTRIFUGAL PUMP

Here is another rugged pump built especially for paper mill operation . . . being vertical type, requires minimum amount of floor space. The following features make this an exceptionally dependable unit for stock transfer service:

- **Axial adjustment between rotating and stationary parts**
- **Renewable wearing parts**
- **Backwall ejector vanes on impeller to prevent binding of stock behind the impeller and also give hydraulic thrust balance**
- **Large, direct passages**
- **Ample flushing and drain connections for easy cleaning**

Fig. 3115 has capacities of 150 to 2000 G.P.M. at heads up to 180 ft. Sizes 4″, 5″, and 6″.

Fig. 3115

THE PUMPS FOR THE LONG PULL

Goulds pumps last longer—save you money. Advanced design, simple construction, and interchangeable parts make Goulds—the pump for the long pull.

For complete information contact your nearest Goulds representative or write direct to Goulds Pumps, Inc., Seneca Falls, N.Y.

MEMBER HYDRAULIC INSTITUTE U.S.A.

Goulds PUMPS INC. Seneca Falls New York

Kingdom and France are the highest tariff nations, while Belgium, Netherlands, and the United States are the lowest. Canada is far higher than the United States, but more liberal than the parent nation.

In the domestic industry, production continues at unprecedentedly high levels, with defense needs supplying sufficient orders to keep the mills in twenty-four hour operation. Wholesalers are experiencing a falling off in orders, but any drop in consumption will have to be more than is now evident to cause any radical cut in mill operating time. Backlogs of orders at the mills are still far above normal.

Newsprint control is still wanted by some

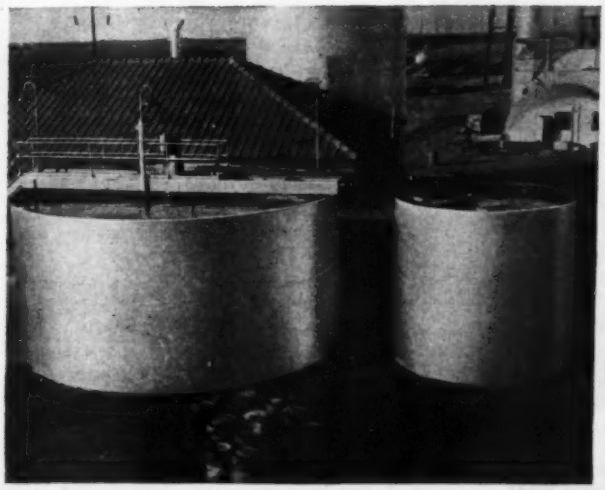
Agitation for newsprint pricing controls continues to attract more Washington attention than the percentage of the grade to total United States production deserves. Senator Johnson of Colorado is the latest recruit to "get into the act," with a letter to Price Stabilization Director DiSalle asking for action to prevent a price increase of nine dollars per ton which he claims is imminent. The OPS can fix a ceiling on domestic newsprint, or even order a rollback, but has no control over the 80 to 85 per cent of the consumption which is purchased directly by newspapers from Canadian mills. In the House of Representatives the special Monopoly Committee is considering asking legislation to require all foreign corporations doing business in the United States to make their records available to Congressional subpoena. The committee may recommend an investigation of a tendency toward monopoly between Canadian, Scandinavian and United States newsprint companies. Needless to say, Canada would not like any proposals to inject United States antitrust procedure into the marketing of Dominion products.

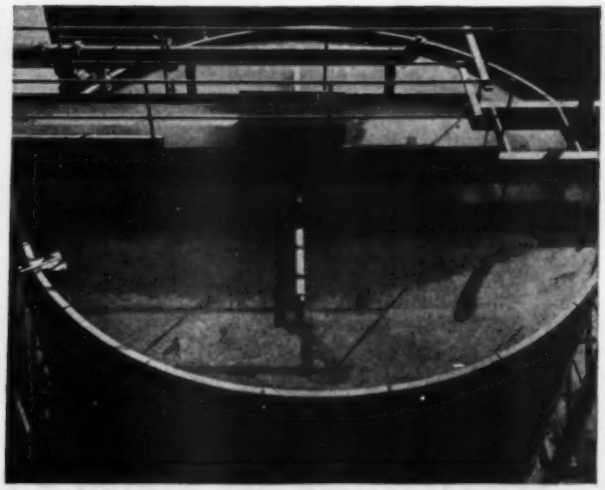
The twelve-nation raw materials committee has been studying world pulp supply as well as newsprint. American publishers may be asked to release 10,000 tons to supply a dozen countries fighting Communist propaganda. Many of the delegates are reported to feel that pulp paper and newsprint are now so scarce that international allocation is inevitable.

▶▶▶ Efforts are being made by the National Association of Waste Material producers to petition to OPS to grant two major adjustments in Ceiling Price Regulation No. 5. One of these would eliminate certain discriminatory provisions; the other would combat excessive price differentials imposed against the producers.

COCHRANE •Sludge• Contact REACTORS

ECONOMICAL REMOVAL OF IMPURITIES FROM INDUSTRIAL WATER SUPPLIES—TURBIDITY, COLOR, HARDNESS—REMOVAL OF SUSPENDED SOLIDS FROM WASTE





COCHRANE'S recognized authority in the field of water conditioning is exemplified in the relatively new field of water clarification by flocculation, in the improved Cochrane Sludge Contact Reactor. This equipment is meeting with pronounced success wherever it has been installed.

The Cochrane Sludge Contact Reactor is distinguished by the fact that the sludge bed is always in suspension, so that the sludge is always present when chemicals and water react.

This is important, in that the precipitates or sludge must not be allowed to settle out on the floor of the tank if maximum clarification or softening is to be obtained. The water as it rises through the sludge bed is both treated and filtered.

Cochrane Sludge Contact Reactors are applicable to

1. Municipal and industrial plants for coagulation and/or softening, removal of turbidity, color, hardness, taste and odor
2. Boiler plants for silica removal
3. Fluoride removal, de-alkalization, iron and manganese removal
4. Paper, textile and other plants for process water—recovery of fibre stock and filler from white water

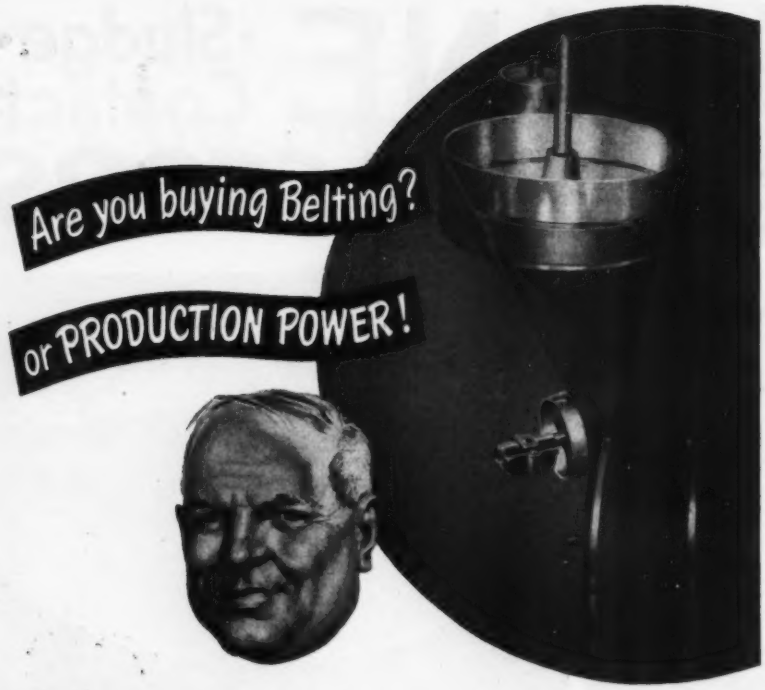
NEW PUBLICATION AVAILABLE

A new bulletin describing the Cochrane Sludge Contact Reactor, and illustrating different applications is just off the press. A copy will be sent on request.

COCHRANE CORPORATION 3114 N. 17th Street, Philadelphia 32, Pa.

In Canada: Canadian General Electric Co., Ltd., Toronto • In Mexico: Babcock & Wilcox de Mexico, S.A., Mexico City • In Europe: Recuperation Thermique & Epuration, Paris

COCHRANE



BOTH!...we use Graton & Knight Engineered Flat Leather Belting

Ques. What is Production-Power?

Ans. Maximum sustained horsepower transmitted to your machines – at correct speeds – economically – with ample reserve for load peaks – and *"fluid drive action"* to absorb starting torque and load shock.

* * *

The simplest and most economical way to insure Production-Power is with Graton & Knight Leather Belting – *engineered* to provide all of the *"live traction"* qualities needed. These qualities are: an improved coefficient of friction, with resiliency, flexibility, strength and freedom from permanent stretch. In addition – some belts must have lateral firmness to work on shifter and stepcone drives (HEART OAK). Some must be resilient and flexible with a very high coefficient of friction, to hug small pulleys, make quarter turns, flex both ways, etc. (RESEARCH®). And some must be resistant to the action of heat, steam, water, oil, acid and alkali fumes (SPARTAN®):

G&K Leather Belting is engineered to deliver more production-power in a given set of conditions. It's all a matter of leather quality, and skill and know-how in processing – *a good belt every time.*

GRATON & KNIGHT COMPANY
Worcester, Massachusetts

HEART OAK · PREMIUM RESEARCH QUALITY · SPARTAN®

100 YEARS OF SERVICE TO INDUSTRY

YOU CAN DRIVE IT BETTER WITH LEATHER®

GRATON AND KNIGHT® *Engineered LEATHER BELTING

Financial

▶▶▶ VARIOUS ELEMENTS, such as the prospect of heavier taxes, reduced profits and industry controls served to check the upturn in security prices during the last month. Paper mill securities did not drop materially, and in most cases any recessions were less than those in other industry stocks.

American Box Board Co.—Net income for four months ended March 31 was $539,527 as compared with $148,339 for the comparable period a year ago.

American Writing Paper Corp.—Net income for the first quarter was $202,885 as compared with $22,105 for the similar quarter a year ago.

Certain-teed Products—Net income for three months ended March 31 was $1,337,456 as compared with $1,085,125 a year ago.

Chesapeake Corp.—Net income for the first quarter was $758,582 as compared with $682,546 a year ago.

Continental Diamond Fibre Co.—Net income for the first quarter was $376,152 as compared with $156,899 a year ago.

Coosa River Newsprint Co.—Net sales for 1950 were $13,876,877; comparison unavailable.

Dixie Cup Co.—Net income for the first quarter was $716,620 as against $329,325 for the same quarter in 1950.

Eastern Corp.—Net income for three months ended March 31 was $598,675 as compared with $339,046 a year ago.

Great Northern Paper Co.—Net income for the first quarter of 1951 was $1,304,750 as compared with $674,147 a year ago.

Hammermill Paper Co.—Net income for the first quarter was $590,708 as compared with $356,243 in the same quarter of 1950.

Hinde & Dauch Paper Co.—Net income for the first quarter of 1951 was $1,114,362 as compared with $582,353 in 1950.

Hollingsworth & Whitney Co.—Net income for three months ended March 31 was $804,630 as compared with $349,289 a year ago.

International Paper Co.—Net income for the first quarter of 1951 was $15,636,484 as compared with $15,364,907 a year ago.

Minnesota and Ontario Paper Co.—Net income for the first quarter was $1,482,067 as compared with $965,824 a year ago.

Nekoosa-Edwards Paper Co.—Net profit of $567,729 for the first quarter is reported as compared with $353,260 a year ago.

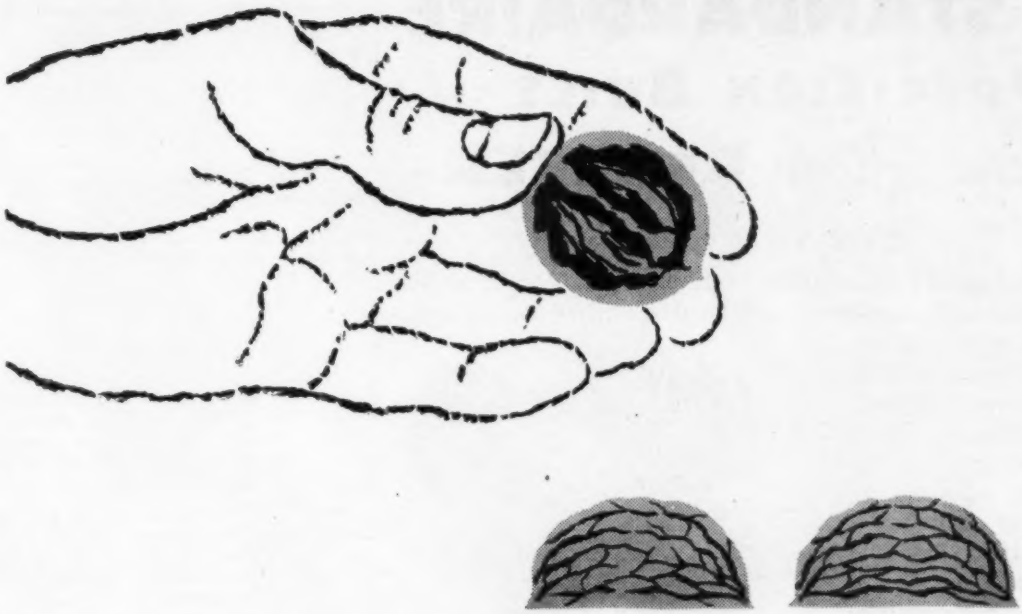
Oxford Paper Co.—Net income for the first quarter was $707,164 as compared with $517,391 a year ago.

P. H. Glatfelter Co.—Net profit in the first quarter was $169,269 as compared with $315,536 a year ago.

Rayonier, Inc.—Net income for the first quarter was $3,114,341 as compared with $2,322,050 a year ago.

Scott Paper Co.—Net income for the three months ended March 31 was $1,602,685 as compared with $1,733,750 for the same period in 1950.

Southland Paper Mills—Net income for 1950 was $3,452,682 as compared with $3,752,841 in 1949.



Purecal didn't just happen

Sure, Purecal* will save you more titanium dioxide than any other extender-pigment. And it will do that while keeping the same brightness, opacity and hiding power.

But there's more to the story than that. To begin with, we make Purecal by *controlled precipitation* of calcium chloride and sodium carbonate. Temperature, pH, proportion of reactants, rate of addition and other variables are controlled automatically. So that the operator can produce any given particle size — even smaller than the finest ground limestone.

Which particle size? Well, here's how we arrived at Purecal M. We varied particle sizes over a wide range, checked them with an electron microscope. We compared each individual "size range"— one against the other — to find which produced the most opacity, brightness and hiding power. We found the size (.2 microns— same as titanium dioxide) that did that — and that size is Purecal M.

*Trade-mark

SODA ASH • CAUSTIC SODA • BICARBONATE OF SODA
CALCIUM CARBONATE • CALCIUM CHLORIDE • CHLORINE
HYDROGEN • DRY ICE • SYNTHETIC DETERGENTS • GLYCOLS
CARBOSE (Sodium CMC) • ETHYLENE DICHLORIDE • PROPYLENE
DICHLORIDE • AROMATIC SULFONIC ACID DERIVATIVES
OTHER ORGANIC AND INORGANIC CHEMICALS

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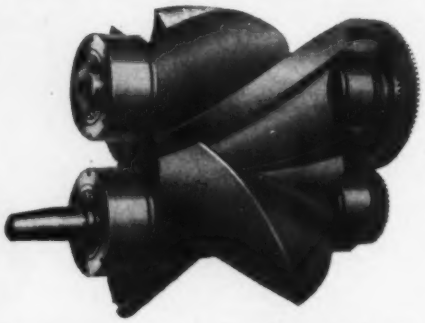
The STANDARDAIRE
PRECISION BUILT
Axial Flow BLOWER

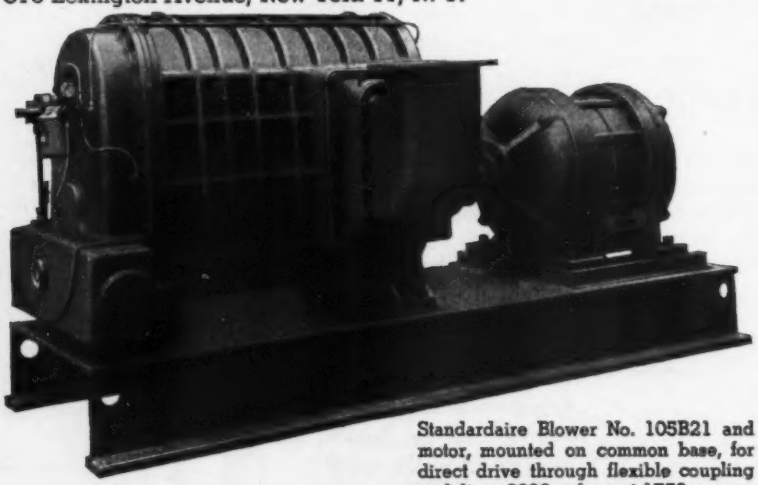
Features Two More Vital Components:

PRECISION ROLLER BEARINGS—spherical type are used on the fixed ends of the rotor shafts and a cylindrical type on the floating ends. With such a design free aligning action of the rotor shafts is assured and specific speed, load, and service requirements are easily met. In addition, this bearing construction fully compensates for any housing distortion which might occur due to temperature differentials.



LABYRINTH TYPE OIL SEALS—Bearings and gears are lubricated by a spray of filtered oil. The oil is controlled by a balanced pressure, labyrinth type seal which gives complete oil control and assures absolutely clean air delivery under all operating conditions.

Such features as precision bearings—frictionless oil seals—hardened, shaved, helical gears—contribute immeasurably to the efficient and dependable performance of the Standardaire Blower—A Modern Machine with Superior Operating Characteristics. For further information write READ STANDARD CORPORATION, Dept. E-62, 370 Lexington Avenue, New York 17, N. Y.



Standardaire Blower No. 105B21 and motor, mounted on common base, for direct drive through flexible coupling to deliver 3200 c. f. m. at 1750 r. p. m.

BLOWER-STOKER DIVISION

FORMERLY The Standard Stoker Co., Inc.
ONLY THE NAME IS CHANGED

READ STANDARD
CORPORATION

NEW YORK • CHICAGO • ERIE • YORK • LOS ANGELES

Sutherland Paper Co.—Net income for the first quarter of 1951 was $814,128 as against $515,309 a year ago.

St. Croix Paper Co.—Net income for the first quarter of 1951 was $341,819 as compared with $285,682 a year ago.

Union Bag & Paper Corp.—Net income for the first quarter was $3,702,693 as compared with $2,199,315 a year ago.

West Virginia Pulp & Paper Co.—Net income for six months ended April 30 was $5,596,000 as compared with $4,862,000 for the comparable period a year ago.

Paper Mill Corporate Changes

Crane & Co.—The manufacturing facilities of the upper mill of the L. L. Brown Paper Co., of Adams, Mass., have been leased to Crane, while the Brown company is completing plans for expansion at its lower mill, also at Adams.

Cornell Wood Products Co.—A two for one split of the common stock has been authorized together with a change of the company's corporate name to Cornell Paperboard Products Company.

Oswego Falls Corp.—The issuance of one additional share of common stock for each share held was completed May 15.

Sutherland Paper Co.—Plans for a two for one split of the common stock will be submitted soon to stockholders, together with other refinancing plans. The redemption of outstanding 4¼ percent convertible preferred stock, and the issue of new stock together with negotiations for banking interests for the sale of long term indebtedness, will raise approximately $5,500,000.

New York Stock Exchange—Stocks
(Closing Prices)

	May 21, 1951	April 19, 1951
A.P.W. Products	6⅝	7⅛
Celotex	16⅛	16¾
Same Preferred	17	17
Certain-teed Products	15⅞	16¾
Champion P. & F. Co.	54¾	53½
Same Preferred	102½	103½
Chesapeake Corp.	* 31-32¼	* 33⅜-34¼
Continental Diamond	13⅞	14¾
Container Corp.	35¼	39
Same Preferred	*100½-101	*100-104½
Crown Zellerbach	52¼	52¼
Same Preferred	102⅝	101¼
Dixie Vortex	61	62
Same "A"	* 61-63	* 61-63
Eastern Corp.	20	21⅜
Robert Gair	13¼	14
Same Preferred	* 19⅛-19⅝	* 19⅝-20
Gaylord Container	27	26½
International Paper	50	53¼
Same Preferred	103¼	102¾
Kimberly-Clark	45	44½
McAndrews & Forbes	* 37½-38½	39
Marathon	* 46-46¾	47
Masonite	33	33
Mead Corp.	23⅜	26¼
Same Preferred	89	* 97¼-98¾
Same 2nd Preferred	* 58-64	* 63-67
National Container	12⅞	13
Rayonier, Inc.	47⅝	51
Same Preferred	36⅝	* 36¼-36⅝
Scott Paper	48	49
Same $3.50 Preferred	91⅝	* 96-97
Same $4.00 Preferred	*105-107	*101-104
St. Regis	13⅝	14
Same Preferred	90½	* 91½-92
Sutherland Paper	51¼	50
Same Preferred	128⅜	123⅞
Union Bag & Paper Co.	43¼	41⅜
United Board & Carton	* 18¼-19	19½
United Wall Paper	3⅝	3¾
Same Preferred	* 25⅜-27¼	* 25½-26½
U.S. Gypsum	107½	122⅜
Same Preferred	*175-178	*177-180
West Va. P. & P. Co.	81⅜	* 80½-82½
Same Preferred	107	*109-110

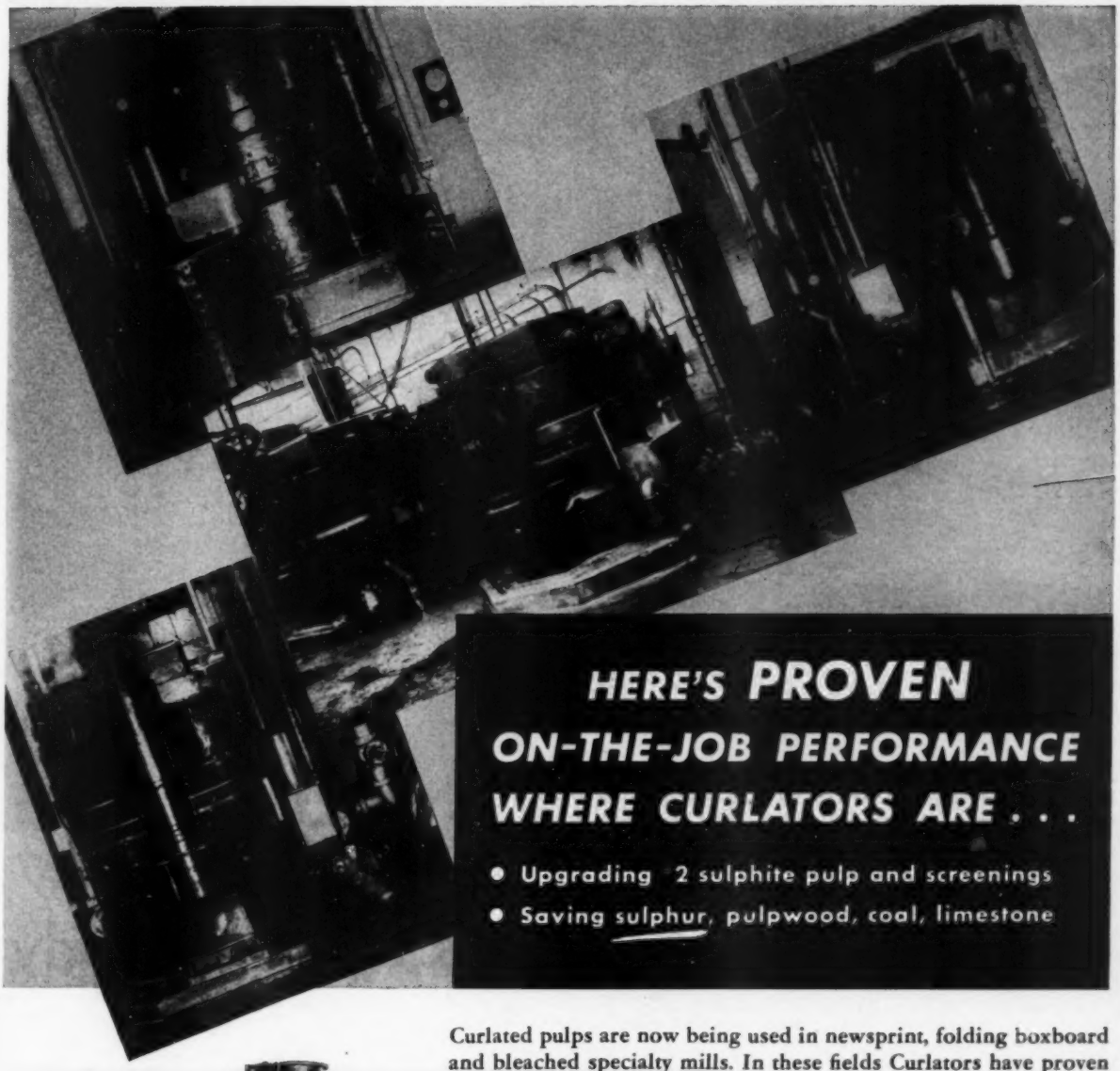
New York Stock Exchange—Bonds

	May 21, 1951	April 19, 1951
A.P.W. Products	90	96
Celotex 3¼%	101	102
Champion P. & F. Co. 3%	101⅛	102
Mead Corp. 3%	104	106

New York Curb Exchange—Stocks

Am. Writing	16½	—
Great Northern	52	48⅛
Hammermill	—	—

*Closing Bid and Asked Prices.



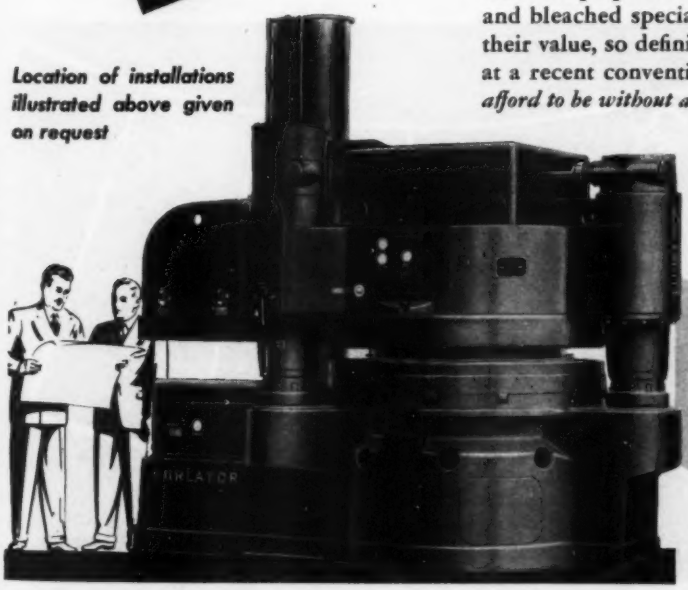
HERE'S PROVEN ON-THE-JOB PERFORMANCE WHERE CURLATORS ARE . . .

- Upgrading 2 sulphite pulp and screenings
- Saving sulphur, pulpwood, coal, limestone

Curlated pulps are now being used in newsprint, folding boxboard and bleached specialty mills. In these fields Curlators have proven their value, so definitely that a sulphite pulp mill executive reported at a recent convention, *"I don't see how any mill in the country can afford to be without a Curlator."* It will pay any mill executive to hear the Curlator story.

WRITE *today for detailed information.*

Location of installations illustrated above given on request



CURLATOR† *Corporation*

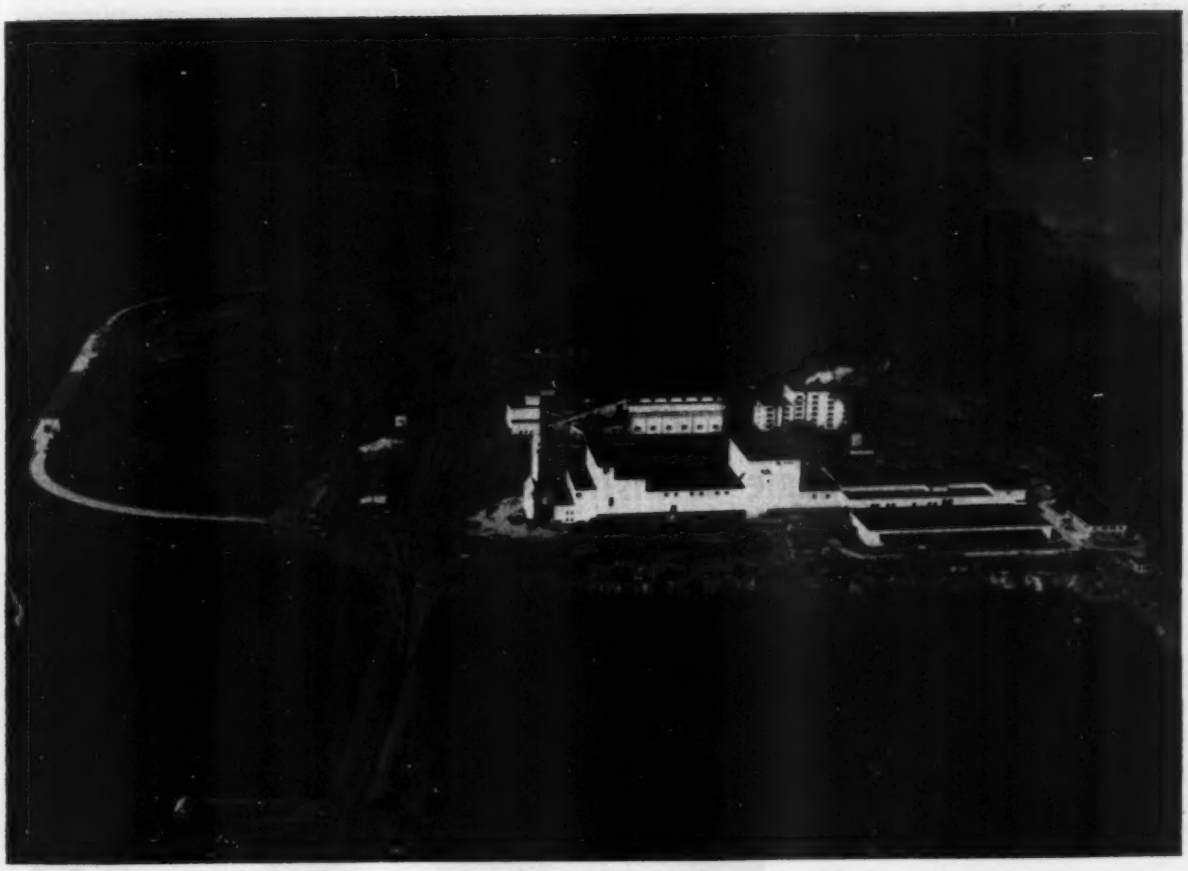
565 BLOSSOM ROAD · ROCHESTER 10, NEW YORK

†T. M. Reg.—Curlator Corporation, Rochester, N. Y.

1947 Columbia Cellulose Co.'s mill site near Prince Rupert, B. C., looked like this before construction started; 3700-ft. semicircular dock was built during the war by the U.S. Army

North America's most westerly

Columbia Cellulose Co.'s new mill at Watson Island is about 40 miles from the southern tip of Alaska. Forest areas under license amount to some 600,000 acres. Available wood, water, manpower and transportation make the location a good one. Edmonton will be the site of another Celanese subsidiary, the Canadian Chemical Co. Ltd.



1951 The new mill started operation in mid-April; the plant covers 35 of the 200 acres of Watson Island; harbor formed by dock is used for log storage

pulp mill now operating

▸▸▸ START-UP OF its Columbia Cellulose Co. Ltd., dissolving pulp mill near Prince Rupert, B.C., marks another milestone in the growth and development of Celanese Corporation of America. Although Celanese has plants in South America and Mexico, this is the company's first venture in Canada. It is not the last however, for another subsidiary, The Canadian Chemical Co., Ltd., has been formed to build and operate a new petro-chemical and cellulose acetate flake plant near Edmonton, Alberta. This subsidiary will utilize part of the production of the new dissolving pulp mill.

Will relieve pulp shortage

Object of the new mill was to assure Celanese an adequate supply of dissolving pulp essential to the continued progress of the company. The mill, which uses the sulphite process, has a capacity of about 200 tons per day of high alpha cellulose—enough raw material for over 200,000,000 pounds of acetate yarn and staple fibers annually.

Costing $27,000,000 the new plant will draw its wood supply from 600,000 acres of timberland in British Columbia. Water supplies at Prince Rupert are more than sufficient to furnish the mill's expected ultimate requirements of 37,000,000 gallons a day; this water is being brought from lakes six miles away from the plant through specially constructed pipelines. Local manpower from the Prince Rupert area constitutes a substantial portion of the labor supply.

Together with an abundance of wood and water, transportation is a most important factor in the selection of a plant site in a remote area such as this. Prince Rupert is served by regularly scheduled air and steamship lines and is the Western terminus of the Canadian National Railways.

Dedication this month

After attending dedication ceremonies in mid-June, which will mark the formal opening of this new Canadian industry at Prince Rupert, we will give you a first-hand report based on our observation of this mill in operation. In an early issue of THE PAPER INDUSTRY will be a complete story on the Columbia Cellulose mill, outlining, among other things:

WHAT processes and equipment were selected, how they were installed, and how they are operated . . .

WHY a location so far removed from other Celanese operations was chosen . . .

HOW the new cellulose mill fits into the integrated Celanese Corporation set-up . . .

WHO is guiding the mill's operations . . . and what firms are responsible for its construction.

PARTICIPATING IN Educational Panel at Institute meeting were (L to R): Dr. J. E. Todd, assistant dean; E. W. Schoenberger, instructor, speech; Dr. J. A. Van den Akker, head, physics group; John G. Strange, vice president and discussion leader; Dr. Roy Whitney, head, chemical engineering; W. M. Van Horn, head biology group; Dr. Harry F. Lewis, dean

"Quest for men" theme of Institute annual meeting

Industrialists advised to aid program for securing more good men for training and future leadership

▶▶▶ A NEW CHALLENGE faced some 300 executives of pulp and paper mill companies and the affiliated industries when they attended the fifteenth annual meeting of the Institute of Paper Chemistry, Appleton, Wis., May 14 and 15. The theme of the Conference was how to keep the necessary supply of technically trained manpower flowing into industry and still keep our military forces strong.

The principal business features of the Conference were the panel discussions. The first day's luncheon, presided over by John L. Riegel, president Riegel Paper Corp., was followed with a panel on the educational program of the Institute; discussion leader, John G. Strange.

Vice President Strange Sets Conference Theme

In his introduction to the panel discussion, Mr. Strange, Institute vice president, drew an analogy setting up the field of higher education as a kind of industry. He said the field of higher education is "big business," and if it be considered an industry, then it is one of the largest industries in this country. Using the year 1947 as a base, he said the net worth of colleges and universities as measured by the book value of land, facilities, endowments, and other restricted funds was over five billion dollars—almost twice the amount which the American Paper and Pulp Association calculated to be the net worth of the pulp and paper industry in that same year. Mr. Strange referred to the President's Commission on higher education, and said the Commission believes there *should be* a minimum of 4,600,000 people enrolled in higher education by 1960.

During the panel discussion, the subject of student selection drew a period of interesting questions and answers.

D. C. EVEREST, chairman of board, Marathon Corp., who presided at morning session on the second day

JOHN L. RIEGEL, president, Riegel Paper Corp., who presided at the afternoon session the first day of the Conference

During this period, such terms as *industrial scientist, scientific generalist,* and *specialist* came up for analysis. It seemed the consensus that the industrial scientist is the product of science and technology over the past fifty years.

In summing it up, Mr. Strange said that in the final analysis, the Institute's program is based on a search for men. This quest starts in the canvassing of various universities and colleges. It continues during the four-year program at the Institute and goes on after these men are employed in the industry. The process is a continuous one, and it involves close teamwork between the Institute and the industry. He concluded by saying, "If we do our part, and if the industry does its part, we shall have gone a long way toward seeing that the paper industry gets at least its share of outstanding young men wherever they may be."

Summary of Panel on Equipment Replacement Read by Dr. Shallcross

The panel discussion on the second day, with D. C. Everest, Marathon Corp. board chairman presiding, was held in two parts. The Economics of Equipment Replacement was the subject of the second discussion period. At the close of this discussion, Dr. Ruth Shallcross, economist at the Institute, summarized the conclusions as follows:

1—All companies need some workable replacement policy which indicates when they should or should not replace their productive equipment.

2—In the problem of replacement, there are obvious cases where the advantage of a new machine is unquestioned and no formal analysis is needed to know that replacement is signalled. However, for the entire productive capacity of a company, the problem of

STUDENTS TOOK PART in the Economic panel discussion on the second day. L to R: Malcolm May, fourth year student; Dr. Roy Whitney, head chemical engineering; Mr. Robert Parkison, third year student; Dr. Ruth Shallcross, economist; Biswanath Sen, fourth year student; D. J. MacLaurin, chief pulp and papermaking

replacement for most of the facilities is not always so clearcut or obvious. Therefore, a replacement analyst who is technically trained, yet able to handle economic studies and able to co-operate with the marketing, production, finance, and tax personnel of a company, is in the best position to formulate guides for replacement.

3. Of all the replacement policies surveyed by Mr. Parkison, he accepts as the best the minimum average cost formula, sometimes called the engineering formula.

4. In essence, this engineering formula pictures all equipment in a company as defenders in the competitive struggle against new and more efficient challengers on the basis of capital and operating cost. However, he believes that no formula can serve as more than a guide to correct thinking concerning machinery replacement. Even then executive judgment may throw out replacement analysis because of legal, marketing, or other considerations.

5. Any approach to replacement requires adequate records on existing equipment to aid those responsible for the formula's application. These data cost money and require time to collect. However, this cost may be, at least in part, offset by the value of the data for tax purposes.

6. Mr. Parkison points out that the ultimate goal in a replacement analysis is the inclusion of a factor of obsolescence for the challenger which has been stressed by Dr. Terborgh (author of new book on replacement) in his writing. However, estimates have to be used for this factor which may prove too impractical at the present time.

Dr. Trytten Addresses Dinner Meeting

At the North Shore Gulf Club, the executives were entertained with an informal dinner, on the evening of the first day. After dinner, they heard Dr. M. H. Trytten, director of scientific personnel of the National Research Council, Washington, D. C., tell of the current problem facing industry. He said this problem was definitely one of obtaining scientifically trained manpower and, at the same time, meeting the demands of the nation's military. He touched on the dispute now under way over deferments for college students. Dr. Trytten said that the nation should consider higher education in terms of national need rather than the individual desire. He asked industry to sell the general public that it is necessary for the good of the country that we maintain a high level of research and development. He told how during the war a Russian scientist, speaking in the Soviet, stated that Russia makes science a national policy, but in the United States science is left merely to chance.

At luncheon on the second day, Westbrook Steele, president of the Institute, read his annual report. He was followed by Ernst Mahler, Institute board chairman and executive vice president of Kimberly-Clark Corp., who outlined the Institute's future.

New Research Foundation Instituted at Lowell

For the purpose of encouraging and administering research sponsored by industry and government, the Board of Trustees of Lowell Textile Institute (Lowell, Mass.), announced on May 15 the establishment of the Lowell Textile Institute Research Foundation.

Officials making the announcement stated that: "The Foundation personnel and the Institute faculty will jointly constitute a staff available for investigating problems involving chemistry, physics, biology, engineering and industrial economics in the fields of textiles, paper, leather, and related areas of interest. . . . The Foundation also will have the benefit of utilizing the unique and diverse equipment and physical facilities of the Institute for its research and experimentation projects."

New Paper Mill Construction Authorized by DPA

THE DEFENSE PRODUCTION Authority has awarded Certificates of Necessity to a large group of paper mills for expansion of present paper and pulp production facilities. Certificates have been issued for varying portions of authorization requested—usually not less than 60 per cent of the figure requested —to the following companies, among others:

St. Regis Kraft Co., East Port, Fla., $17,638,000 for a new pulp mill

Columbine Development Co., Columbine, Colo., $15,846,000 for a new bleached kraft mill, instead of earlier plan for a newsprint mill

Hoberg Paper Mills, Green Bay, Wis., $100,000 for expanded production of towels and sulphite pulp

Champion Paper and Fibre Co., Canton, N.C., $4,336,418, for bleached chemical pulp

Chesapeake Corp., West Point, Va., $934,648 for expansion of pulp facilities

Manchester Board and Paper Co., Richmond, Va., $4,000,000 for expansion of paperboard production

Rhinelander Paper Co., Rhinelander, Wis., $1,436,303, for expansion of glassine and wax paper facilities.

National Container Corp., Valdosta, Ga., $25,000,000 for new kraft pulp mill. Also $600,000 for expansion of box plant at Dallas.

Crown Zellerbach Corp., Camas, Wash., $19,795,500 for pulp production

New England Forest Products, Inc., Berlin, N.H., $2,850,000 for fiber board production

Gaylord Container Corp., Bogalusa, La., $6,975,630 for sulphate pulp production

The Mead Corp., Chillicothe, Ohio, $9,158,000, for expansion of pulp production

Union Bag & Paper Corp., Savannah, Ga., (amount not announced), install equipment to manufacture semichemical pulp from gumwood

International Paper Co., New York City to double production of dissolving pulp at Natchez (Miss.) plant and to build a chemi-fibre plant adjoining its Mobile (Ala.) plant. Cost of former not given; allowance on second plant, $12,926,591.

(More details on some of these announcements appear in this and previous issues of THE PAPER INDUSTRY.)

Double-row tree planter developed and built by the Woodlands Department of Nekoosa-Edwards Paper Co. Approximately 24,000 trees were set out by the crew on the first 8-hour trial period

Double-row tree planting is feature of machine designed by Nepco foresters

▶▶▶ A new double-row tree planter designed and built by Nekoosa-Edwards Paper Co., Port Edwards, Wis., is now operating in the company's central Wisconsin timber holdings.

Outstanding feature of the new machine is that it plants two rows of trees at the same time whereas other standard tree planting machines are designed to set out only one row at a time. In designing and building the machine, Nepco forestry crews made use of two standard Lowther planting rigs mounted side by side on the rear of an International TD6 cat-type tractor.

Another important advantage results from mounting the device in such a manner that the entire mechanism and planting crew can be elevated instantly by hydraulic jacks for speed and efficiency in turning around at the end of the field. Other standard planters operate on a trailer principle and require more time and room for the wide arc in turning around.

On the first eight-hour trial run of the new planter, 24,000 trees were set out. This nearly doubles the number usually planted with single-row models. When the crew becomes better familiarized with the new machine, it is expected that the planting rate will be further increased.

The new machine will enable Nepco foresters to plant more trees at a lower cost. Two single-row planters require two tractors and six men for planting. It is expected that four men and one tractor can accomplish the same job with the new planter.

Several years ago, the first single-row tree planting machines were developed and tested on Nekoosa-Edwards lands. The new machine is another example of the technical progress that enables Nekoosa-Edwards to expand its reforestation efforts year-by-year to a point where this year the company expects to field plant 800,000 pines and make 500,000 more available free of charge to central Wisconsin landowners. The company grows its own planting stock from seed in its forestry nurseries.

Of more than 110,000 acres of land under the company's forestry management, approximately 50,000 acres are in central Wisconsin, including nearly 18,000 acres that have been field planted since the company began its forestry program nearly 27 years ago.

I. P. Co.'s New Container Plant in Atlanta Is Nearly Completed

The new Atlanta (Ga.) plant of International Paper Co., New York, (Cf. P.I., Oct., 1950) which was planned to produce $45,000,000 worth of paper milk containers a month, is nearing completion.

Constructed on a 10 acre plot which allows room for expansion, the plant contains 50,000 square feet of floor space. When complete, it will represent an investment of about $500,000, and will give employment to about 125 workers who will earn an annual payroll of about $400,000.

D. D. Wilson is manager of the plant.

Mead to Expand Pulp Capacity at Kingsport and Chillicothe Mills

Certificates of necessity have been awarded by the DPA to The Mead Corp., Chillicothe, Ohio, for construction of additional pulp-making facilities at its Chillicothe and Kingsport (Tenn.) plants. (Cf. P.I., May, 1951)

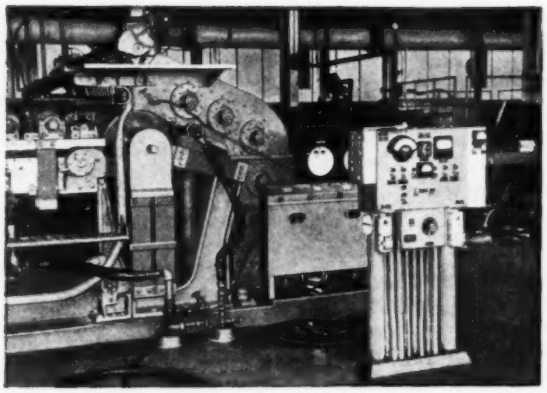
At Chillicothe, pulp production will be expanded about 30 per cent. The increased wood consumption will require the installation of two barkers, additional chippers, and other wood-handling equipment. A new recovery unit with a 1200-hp. boiler, producing steam at 900 lb. pressure, and a 7500-kw. turbine generating 13,800 v. power, will be installed to satisfy the increased power requirements. The project, which is already under way, is estimated to cost about $4,900,000.

At Kingsport, Mead is spending $4,258,000 to expand its soda pulp production. The present plant, rated at 105 tons a day, will be increased to 225 tons a day. Changes required in the wood preparation department to achieve this expansion include an additional barking drum and chip screen. Although adequate digester capacity is already available, new brown stock washing equipment will be needed, as well as a major expansion of the bleach plant and complete rebuilding of the causticizing plant. A new 150,000-lb. per hr. power boiler, a 6000-kw. turbine, and extensive changes in the water supply system are the major changes required in auxiliary equipment.

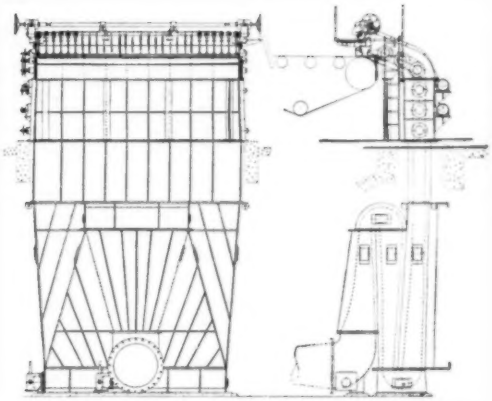
ELECTED TO FILL VACANCIES on The American Forestry Association's Board of Directors are Sherman Adams, governor of New Hampshire, and Stanley G. Fontanna, new dean of the School of Natural Resources of the University of Michigan. A news release from D. C. Everest, Association president, also comments that Mr. Fontanna is succeeding Samuel T. Dana, long-time AFA board member, in the University of Michigan chair.

A CERTIFICATE OF NECESSITY has been granted St. Joe Paper Co., Port St. Joe, Fla., for the construction of an expansion project at the pulp and liner board plant. Plans call for increasing daily capacity from 400 to 750 tons; construction will be begun as soon as materials are available.

OUTSTANDING SLICE ARRANGEMENTS

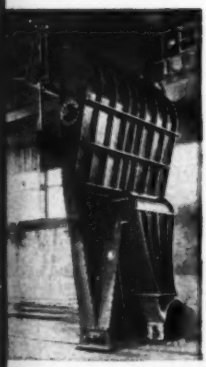


Closed Pressure Slice on machine designed for speed of 2100 feet per minute.



Assembly drawing of Flow Spreader and Closed Pressure Slice.

Shop assembly of Flow Spreader and High Slice.



The new Puseyjones Closed Pressure Slice combined with the Flow Spreader, now proved in mill operation, provides the ideal approach flow to the Fourdrinier wire on today's high-speed machines.

Three of these Slices are now in operation . . . and three are under construction.

For moderate speeds, the Puseyjones High Slice may be used where preferred. It is now in successful operation on ten installations . . . and two are under construction.

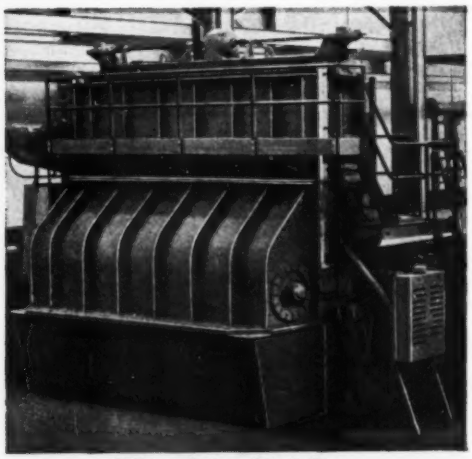
Whatever your stock or operating speed may be, these Slice Arrangements and Flow Spreaders will give the best possible formation for every condition. The *right* slice for your new or rebuilt machine is a matter between you and the Puseyjones engineers. Write or call us today.

THE PUSEY AND JONES CORPORATION

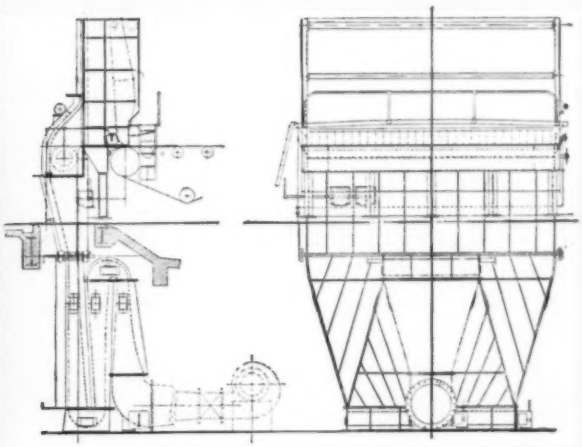
Est. 1848 — Builders of Paper-Making Machinery

Fabricators & Welders of all classes of Steel & Alloy Products

Wilmington 99, Delaware, U. S. A.

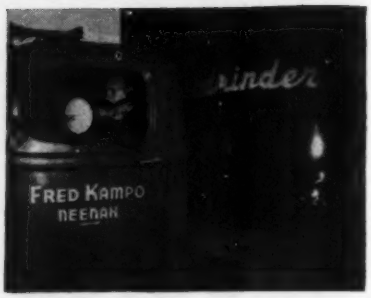


Mill installation of High Slice.



Assembly drawing of Flow Spreader and High Slice.

ROADBINDER FLEET of four trucks operated by Kimberly-Clark Corp., Neenah, Wis. Spent sulphite liquor is hauled from company's Kimberly mill for use as road surfacing. Trucks vary in size from 1000 to 4000 gallons



Radio-telephone is used to dispatch and direct trucks from the mill or from one of the corporation's service cars

Kimberly-Clark Operates Fleet of Roadbinders

▶▶▶ Travel in the State of Wisconsin has been improved through the application of waste sulphite liquor to unsurfaced roads. This service was started last year by Flambeau Paper Co., Park Falls, Wis. (Cf. P.I. Oct., 1950, p. 723)

This year the Kimberly-Clark Corp. has put into service a four-truck fleet of Roadbinders which are equipped with two-way radio telephones for dispatching the trucks. The company's program for the coming six months includes service to counties, townships, and private consumers. It is expected that more than 13,000,000 gallons of material will be used during the summer months on roads, parking lots, and driveways; a maximum number of users can be supplied.

Roadbinder is delivered by Kimberly-Clark at a price that defrays the cost of distribution; the low cost of application has made it highly desirable in certain kinds of highway work. A study released last year by the Institute of Paper Chemistry indicated that the material is noncorrosive and has no harmful effect on metal automobile parts.

A town highway official in an area which is now using the material, estimated that replacing the yearly loss in gravel alone would cost his county about $150 a mile on certain roads. This is about the same as the cost of applying Roadbinder. Experience shows that such an application would be effective over a considerable period, and in the meantime would reduce maintenance and grading problems on that road. Blacktopping costs some $4,000 to $5,000 a mile, and oil, used simply as a dust layer, costs about $550 a mile.

A NATION-WIDE PROGRAM OF educational meetings was sponsored by Department of Commerce field offices in 20 principal industrial centers from May 15 to 22. Acquainting business and industry leaders with operations of the Controlled Materials Plan, the meetings were conducted by the National Production Authority in Detroit, Seattle, Portland, San Francisco, Los Angeles, Chicago, Minneapolis, Denver, Kansas City, St. Louis, Philadelphia, Boston, New York, Cleveland, Pittsburgh, Houston, Dallas, New Orleans, Atlanta, and Richmond. Three NPA officials and one representative of the Department of Defense made up each group of discussion leaders.

Continental Can Plant at Lyons Falls Reported Sold to Brazilians

A late report states that the Continental Can Co. plant at Lyons Falls, N.Y., has been sold to a group of Brazilian business men.

It is further stated that the new firm plans to make paper cartons, printing paper, and groundwood specialties. The plant normally employs 250 workers and produces about 240 tons of sulphite daily.

The Continental Can Co. purchased the plant six years ago from Gould Paper Co.

National Container Plans New Mill at Valdosta—Expansion at Dallas

National Container Corp., Long Island City, announces plans for a $25,000,000 kraft pulp, board and paper mill at Valdosta, Ga., which will have a daily rated capacity of 500 tons and will employ about 1000 workers. Although complete construction plans on the Valdosta mill have not yet been released, it is understood that the project has been under consideration for some time, pending completion of surveys by the forest service of the Department of Agriculture on availability of pulpwood in the section. Cost of the plant will be rapidly amortized for income tax purposes under a certificate of necessity already granted.

The National Container Corp., of Texas, a subsidiary, will completely integrate its box plant at Dallas, Texas. Equipment will be installed for the manufacture of corrugating board. Also the most modern box making equipment will be installed. Cost about $600,000.

Construction on the building already has begun, and it is expected the plant will be completed by October of this year. The new plant will employ seven or eight times as many workers as the present plant and the floor area will cover five times as much space.

This expansion was necessitated because the capacity of the Dallas plant has been inadequate to meet the demand of customers in the Southwest.

NEW PAPERBOARD FACILITIES needed for defense purposes by Pacific Paperboard Co., Longview, Wash., can be constructed by the firm; a certificate of necessity, which also allows the firm to deduct half the anticipated $27,272 from its tax bills for the next five years, has been granted.

I. P. Co. Gets Grant To Build Chemifibre Plant at Mobile

First news of an announcement that International Paper Co. will build a new $15,000,000 chemifibre plant appeared in this section last month.

The company advises that certificate of necessity for $12,926,591 of the cost has been granted by the Defense Production Administration.

According to the DPA, the company's application for a certificate of necessity scheduled November 15, 1952 as the date for beginning of production in the new plant, and contained an estimate that by January 1, 1953, production will be at the rate of 400 tons of pulp a day.

In view of the necessity to arrange priorities for materials as well as the working out of other details in connection with the project, construction

Control CALIPER and WEIGHT AUTOMATICALLY

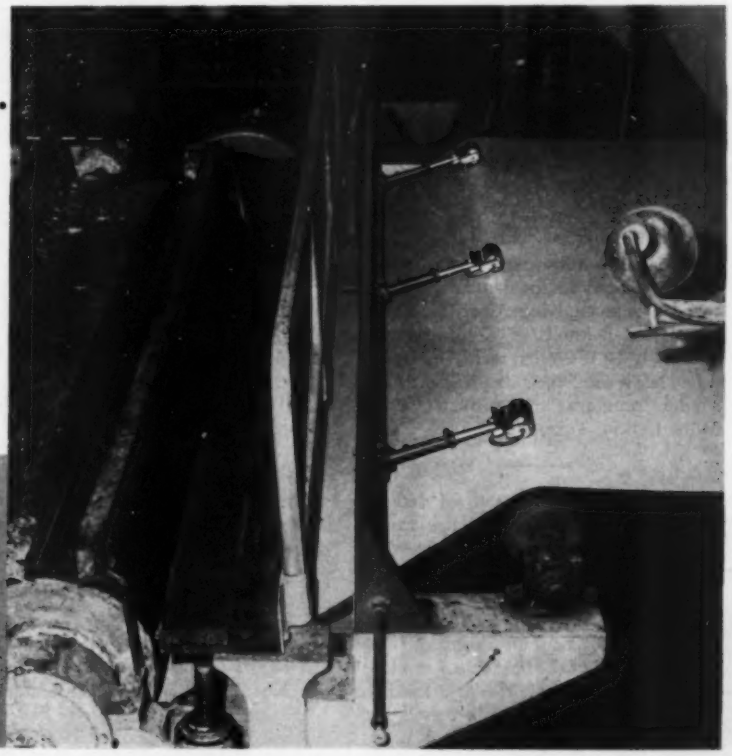
CUT COSTS • IMPROVE QUALITY • SAVE TIME • INCREASE TONNAGE

The Hurletron Automatic Caliper and Basis Weight Control will maintain density of plus or minus 3% on board within a complete range of 5 to 100 points at the dry end.

Think what that means . . . more uniform caliper . . . more uniform basis weight throughout the run . . . increased hourly production . . . a reduction in man and machine hours . . . a definite saving in stock tonnage through elimination of excess density . . . increased production through prevention of broke . . . and a more salable product due to improved quality. The Hurletron unit accomplishes all this through a unique system of controls which are automatic, positive and continuous.

- It automatically measures thickness at 40" intervals *clear across the sheet.*
- It automatically provides a continuous, permanent record of wet end caliper variations.
- It automatically makes corrections, when required, by increasing or decreasing flow from the stock flow regulator.
- It recognizes momentary oscillations and transitory signals, but corrects *only* when a *definite trend* has been established in the sheet.
- It automatically signals the operator when a drift across the sheet is indicated.
- It provides a continuous reading and record of caliper at the dry end giving a complete history of every foot of paper or board in the roll.

The Hurletron Automatic Caliper and Basis Weight Control is precision engineered and ruggedly built to withstand the punishment of round-the-clock service. Its unique advantages have been thoroughly proved by long service in a number of the country's leading mills.



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Automatic
CALIPER and WEIGHT CONTROL

presumably will not get under way for several months.

Except that first plans call for the plant to have a capacity of 140,000 tons of pulp a year, no further information has been given as to the exact size of the project which will be erected on a site adjoining the company's present paper and pulp mills.

Olin Products Co. Formed To Handle Cellophane From New Plant

A new company, the Olin Products Co., Inc., has been formed to distribute Olin cellophane in the packaging field. This company, a subsidiary of Ecusta Paper Corp., Pisgah Forest, N.C., will have temporary headquarters at 270 Park Ave., New York City. A new mill for the production of cellophane is now undergoing completion adjacent to the site of the Ecusta company, which is a subsidiary of Olin Industries.

James L. Spencer

The new corporation will have the same executive committee as both Olin Industries and the Ecusta company, consisting of John M. Olin; Spencer T. Olin, first vice president.

James L. Spencer has been made vice president and director of sales of the new company. The same executive committee will serve Olin Products Co., Olin Industries and the Ecusta company.

Olin cellophane production at the new plant will be 33,000,000 pounds annually. It is expected the new cellophane plant will go into production with eight machines in September.

THREE NORWEGIAN GRADUATE foresters have arrived in the United States to spend a year studying American timber production methods. Two of the men will study at Weyerhaeuser Timber Co., Tacoma, Wash.; the third will pursue a similar program at Southland Paper Mills, Lufkin, Texas.

HEAVY CONSUMER DEMAND of 100 per cent rag content papers has caused Crane & Co., Dalton, Mass., to lease the Upper Mill of L. L. Brown Paper Co., Adams, Mass. A production rate of about 40,000 pounds a week will probably be maintained for the next six or eight months; facilities being used include a 77 inch machine which has been idle since the Upper Mill ceased production in 1948.

Pilot Plants Working on Bagasse Pulp

A report issued by the University of Louisiana announces that three pilot plants are now making paper from bagasse pulp—refuse from sugar cane. Paul M. Horton and Arthur Keller, assisted by graduate students, say that their six years of experimentation have been highly successful, and they are now proceeding to the next step, the determination whether laboratory and experimental plant operations can be developed on a scale to be commercially practicable.

There is no question that, experimentally, bagasse can be used for the making of good quality paper. In the experimental plants, about 27 per cent of the raw bagasse can be recovered as high grade fibre.

D. J. Murray Announces Plans for New Building

When sales of D. J. Murray Manufacturing Co., Wausau, Wis., showed an increase of 212 per cent during the first quarter of 1951 as compared to a similar period in 1950, company officials determined to complete plans for expansion which will include a new building.

Built of brick, the two story building will add 30,000 square feet of floor space to the company's facilities, for a total of 170,000 square feet. Machines from the more conjested areas of the present machine shop will be removed to the new building so that more room will be allowed for assembly purposes. Anticipated cost of the new building has not been revealed.

Bulkley, Dunton Pulp Co. Offers New Service With Colloidair Save-all

A new engineering service has been announced by Bulkley, Dunton Pulp Co., New York City, through Dr. Robert A. Baum, manager of its Engineering Division.

In connection with this service, Bulkley, Dunton features a new and improved flotation system—the Colloidair Save-all—which is offered for application in white water recovery and treatment of total mill effluent.

The company states that patents are now pending, and the flotation unit now sold by Bulkley, Dunton Pulp Co. will bear the name of Colloidair Separator. Applications will be surveyed and test efficiencies run by experienced engineers. Results of these tests will be reported to mills in advance of installation.

New offices and extra personnel have been established throughout the United States to handle this service.

Morningstar, Nicol Marks 100th anniversary

This year marks the 100th anniversary of Morningstar, Nicol, Inc., New York, N. Y. This company, manufacturer of starches, dextrines, and adhesives, has expanded until it now has operations in 20 states.

Joseph Morningstar

The present head of the company, Joseph Morningstar, president, is a grandson of Charles Morningstar, founder of the company, originally known as Charles Morningstar and Co. Associated with President Morningstar are his two brothers, Robert F., of New York; and Percy P., of Boston; his son, Thomas, of New York, and a nephew, Joe Barry Morningstar, of New York. George J. Muller, of New York, first vice president of Morningstar, Nicol and Murray Stempel, of Chicago, second vice president, are associated both with Morningstar, Nicol and with Paisley Products, subsidiary company which manufactures a special line of resin adhesives, glues and related chemical products.

Among the events planned by the company for its anniversary year, one of the important features is a profit-sharing plan that will benefit all employees with two or more years of continuous service. This plan includes the employees of all subsidiary companies: Paisley Products, Inc., New York and Chicago, and Canalport Building Corp., Chicago; Aroostook Potato Products, Inc., Houlton, Maine, and Park-Leggett-Altman Co., Minneapolis.

The Morningstar Co. acts as sole selling agents for Magic Valley Processing Co., Twin Falls, Idaho, and the New England Starch Co., Houlton and Mars Hill, Maine.

ORGANIZATION OF A NEW MECHANICAL power department has been announced by Allis-Chalmers, Milwaukee. The former manager of Allis-Chalmer's steam turbine department, W. A. Yost, will head the new department. Mr. Yost joined the firm in 1943 as head of the marine division of the Turbine Department; he was named assistant manager of the department in 1945.

IN A TRANSACTION INVOLVING scale patents, equipment, parts and inventory, Yale & Towne Manufacturing Co., Philadelphia Division, has sold its industrial scale business to Detecto Scales, Inc., Brooklyn, N.Y. None of the Yale

BATHURST POWER & PAPER COMPANY

installs

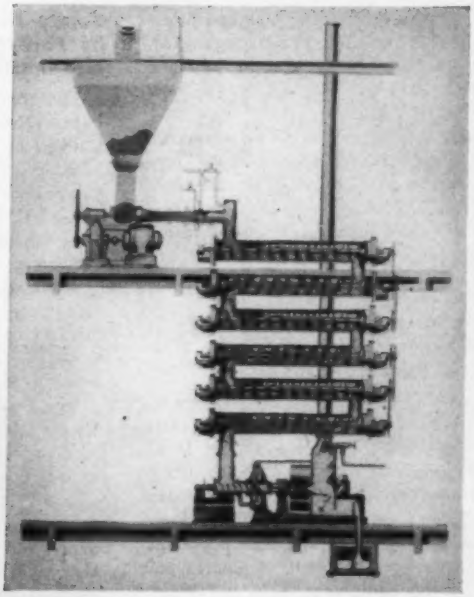
2 CHEMI-PULPERS®

to produce semi-chemical pulp from unbarked, mixed hardwoods for making corrugating board

These Chemi-pulper installations comprise two 6-tube units. The operation uses unbarked, mixed hardwoods exclusively together with kraft cooking liquor for producing semi-chemical pulp. Provision was made for two additional pipes in each Chemi-pulper for future requirements.

The Chemi-pulpers operate continuously, producing a uniform pulp for making their high-grade corrugating board.

These Chemi-pulpers will effect substantial savings in steam, power and labor costs. Compact design and construction permitted a saving in building space.



Multiple-unit
B-K REACTION CHAMBER
with Asplund Defibrator

Flow drawing shows operation of one of the two Chemi-pulpers installed in Bathurst Power & Paper Company mill for producing semi-chemical pulp for corrugating board.

PIA INC.

PAPER and INDUSTRIAL APPLIANCES, INC.

122 EAST 42nd STREET ● NEW YORK 17, N. Y.

trade marks except "KRON" have been released with the sale, which was effected on the first of the month. Space, machine hours and manpower released by the sale of the scale business will enable Yale & Towne to relieve the pressure of defense requirements for Yale industrial trucks and hoists.

New Headquarters Planned for Potdevin Manufacturing and Sales Operations

After 50 years at its Brooklyn, N.Y., location, Potdevin Machine Co. will move all manufacturing and sales operations to a new plant now being constructed at Teterboro, N.J.

Situated on a six acre tract, the new building will be a one story brick structure equipped with radiant heat which will have a manufacturing space of about 102,800 sq. ft. Both the present Plant No. 1, where paper bag and printing machinery is currently manufactured, and the No. 2 Coating Machine Division will be situated in the new building.

Space in the new building—expected to be ready for occupancy about September 15—will accommodate executive offices for Potdevin Export Corp., and will allow room for anticipated future expansion.

New Sales Company Formed and Name Changed for Sveen Pedersen Save-all

The Sveen Pedersen Flotation Save-all, used in the United States since 1938, hereafter will be known as the *Sveen Pedersen Flotation Separator.*

A new organization, the Sveen Pedersen Sales Corp., 35-41 - 11th St., Long Island City 6, N. Y., has been appointed exclusive agent to sell, engineer, and service this equipment.

There has been no change in the separator—the Wegner Machinery Corp. will continue to manufacture it. This arrangement has been made to simplify the manufacture of new equipment and the servicing of existing units.

ARRANGEMENTS HAVE BEEN COMPLETED for the manufacture in Italy of a limited line of the stock preparatory equipment of Shartle Bros. Machine Co., Middletown, Ohio. Manufacture of the equipment (including Hydrapulpers, Hydrafiners, jordans, screens and replacement parts) will be carried on from American drawings by Fabbrica Macchine S.P.A. of Naples, Italy, and will be handled through the Milan, Italy, offices of Dr. Milos Krofta, Black-Clawson representative in Italy and Austria.

GRADUATES OF FORESTRY COLLEGE pause after tour of Sandy Hill Iron and Brass Works

Sandy Hill Plant Visited by Forestry College Graduating Class

The graduating class of the Pulp and Paper Division of the New York State College of Forestry, Syracuse, N. Y., paid its annual visit to the plant of Sandy Hill Iron and Brass Works, Glens Falls, N.Y., on May 8. The week of the 7th was spent visiting paper mills in that area.

While on tour of the Sandy Hill plant, the visitors watched a demonstration of Sandy Hill's "Peppy Peeler," a portable wood peeler designed for peeling in the woods (Cf. P.I., March, 1951, p. 1294).

The graduates were particularly interested in the Sandy Hill plant because of the recent association of W. O. Hisey with that company (Cf. P.I. May, 1951, p. 195) The laboratory paper machine at the College of Forestry was built by Sandy Hill during the time when Mr. Hisey was on the faculty of the Department of Pulp and Paper Manufacture. Mr. Hisey was largely responsible for the building and equipping of the semi-commercial laboratories at the college.

Infilco Completes Relocation Move Begun Last Fall

Removal of executive and engineering offices of Infilco Inc., to Tucson, Ariz., begun late last fall (Cf. P.I., September, 1950), have been completed with the establishment of the advertising department at the Tucson location.

Infilco factories and laboratories remain in Chicago, where the firm has been located for 58 years. Engineering, sales and advertising functions of the firm are now being administered from Tucson offices currently located in temporary quarters. Plans will shortly be made public concerning company plans for construction of a new building to house the executive branches of the firm.

Norman H. Tripplehorn has assumed the post of advertising manager for the company, and took over his new responsibilities when the advertising offices were relocated.

LARGER PURCHASING OFFICES have been constructed by Hooker Electrochemical Co., Niagara Falls, N.Y., directly across the street from the firm's main plant on Buffalo Avenue. No change has been made in the mail address of the new offices, installed so that visitors to the purchasing department need not enter the main plant guard house.

Link-Belt Constructs Modern Factory at Colmar, Pa.

Construction has begun on a modern engineering and manufacturing plant being built for the manufacture of elevating, conveying and processing machinery by Link-Belt Co., Chicago.

Situated at Colmar, Pa. (3½ miles from Lansdale), the plant is designed for efficient straight-line manufacture from the receiving department at one end of the 880 feet long building to the shipping department at the other end. The plant will include about 300,000 square feet of floor space, including a two-story office building and an employee cafeteria. The layout is planned to allow future expansion to twice its initial size.

CONSTRUCTION HAS BEGUN on a new corrugated container plant being built at Youngstown, Ohio, for Ottawa River Paper Co., Toledo. Recently the firm expanded by 30 per cent facilities at the Toledo plant, and is planning a 20 per cent expansion of production capacity at its Flint, Mich., mill.

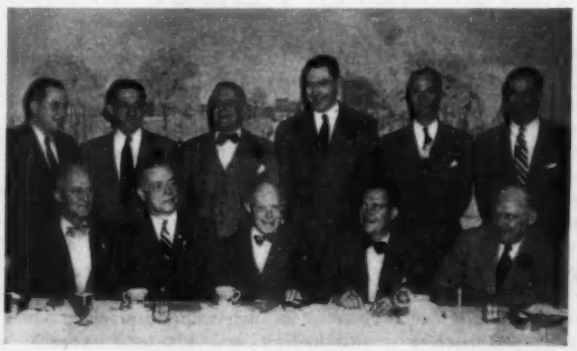
The Paper Industry Pictured Highlights

HAROLD BLANCKE, president of Celanese Corp. of America. New dissolving pulp mill of Celanese affiliated company, Columbia Cellulose Co., Ltd., has now started up at Prince Rupert, B. C., Canada. (See pages 268-269.)

NO LOST-TIME ACCIDENT for 25 years won for the Nepco Lake Power crew safety award from Nekoosa-Edwards Paper Co. L to R: Harold Roberts; John E. Alexander, company president who presented plaque; Wm. Googins; Geo. Johnston, foreman during entire period, who received it; Phillip Millenbah; E. P. Gleason and Edw. Kiesling.

PAPER DRESS wins prize for Mrs. Audrine Cowart, Savannah beauty operator when she represented pulp and paper industry at recent Georgia Hairdressers Ass'n. Dress was made of Union Bag's green creped kraft.

SPONSORED BY ECA, this Paper and Board Packaging Mission visited Experiment Station of Hercules Powder Co. last month. Delegation shown here with Hercules men on the steps of the Country Club at the Experiment Station. At left of front row is M. M. Bixby; at extreme right of same row is P. F. Neumann, both of Hercules. At left of the third row is Dr. J. H. Long, of Hercules. Represented in group are: Denmark, France, Austria, Belgium, Germany, Greece, and Ireland.

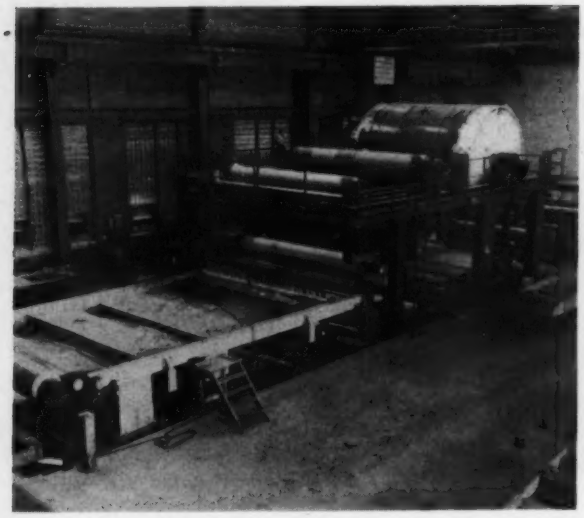


TEN PAST PRESIDENTS and the current leader of the Philadelphia Paper & Cordage Association were honored at luncheon on occasion of PPCA's 25th Anniversary. L to R: seated—H. Satterthwaite, Geo. Corse, Harold T. Robinson (1951), Fred S. Balch (1st pres.), and Harry Smith. Standing—John Shinners, Harry S. Platt, J. R. Howarth, E. V. Rementer, Frank J. Bushemi, and Randall Decker.

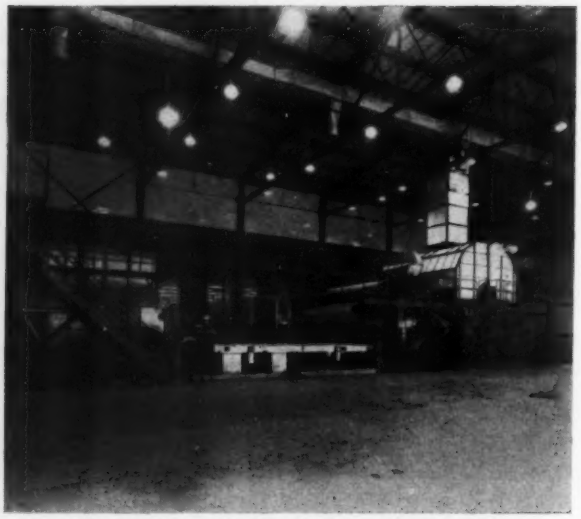
FOURTH ANNUAL DINNER of Union Bag and Paper Corporation's Quarter-Century Club was held recently at the Waldorf-Astoria Hotel, in New York City, with a large attendance. Members of the organization's administrative personnel are shown here with Alexander Calder, company president. Membership in the Club has now reached a total of 124.

NORTHERN PAPER MILLS on the Fox River at Green Bay

JUNE, 1950—New machine room under way



FEBRUARY, 1951—Installing new machine



APRIL, 1951—Machine complete—ready to go

Milan Boex
President

H. W. Gochnauer
Chief Engineer

Northern Paper Mills

▶▶▶ COMPLETION OF a new Yankee type, crepe toilet tissue machine brings the number of units in operation at Northern Paper Mills, Green Bay, Wis., to a total of seven. Production, increased by the new machine, is currently averaging about 76,600 tons a year; this figure will undoubtedly increase as the new machine (No. 5) reaches maximum production. The mill currently employs about 1000 men.

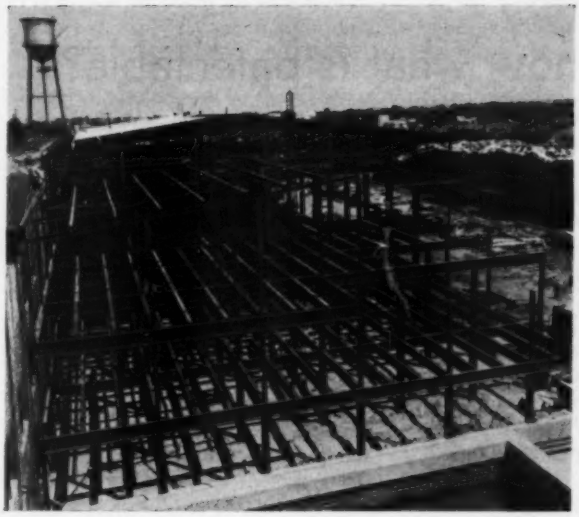
Such an output would undoubtedly have been inconceivable to the seven men who merged their interests fifty years ago to found the firm. Then, the mill employed 25 men whose work resulted in 800 tons of paper per year.

During the first two years of production one small cylinder type machine manufacturing both rolls and packets of sheet toilet tissue, was in operation. This early package tissue was a forerunner of the present day cabinet tissue, and was cut in small packages which were punched at one end and wired so that they could be hung on a nail. In 1904 a second and larger machine was installed for the manufacture of a variety of home-use paper as well as for turning out catalogue and newsprint.

Continuous expansion

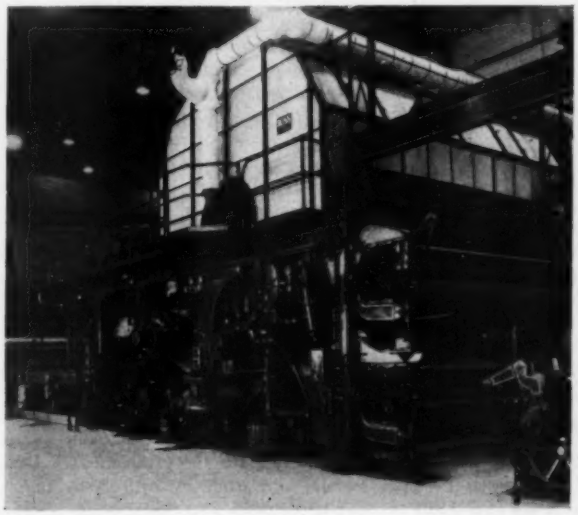
In 1910 facilities were further expanded with the addition of a third machine and the buildings necessary to house it. By 1916 the company had erected its own sulphite plant, production had attained 9000 tons a year, and 100 men were employed by the firm.

Steadily increasing demand for Northern products demanded a steady company expansion; a sixth paper machine—with a new office building and

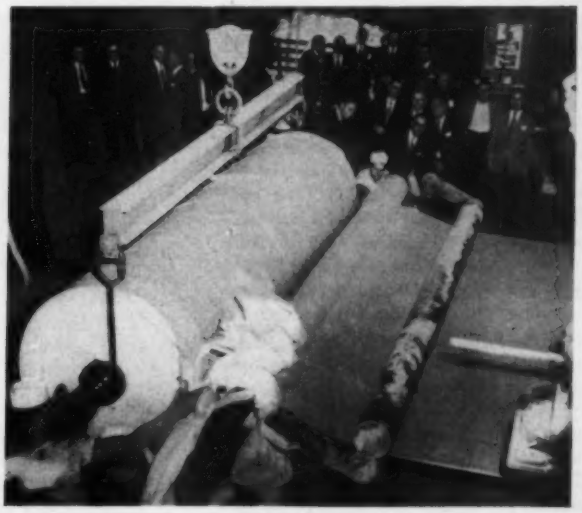


AUGUST, 1950—Steel work up

OCTOBER, 1950—Building almost completed



YANKEE DRYER and press section



APRIL 21, 1951—33 tons salable paper made first day

starts new Yankee tissue machine

a new digester—was installed in 1919. By 1920 the groundwood mill, also installed in 1919, was in operation; in 1927 the firm erected its own power plants on the Menominee River.

A complete modernization program was instituted in 1929; pulp storage tank facilities were re-located in a new three-story building which also housed the machine and electric shops, and other new buildings were erected when the seventh paper machine (capable of producing 40 tons of paper a day) was added.

The Menominee power plants were sold in 1938, and a modern steam plant was built at the mill site. Still in operation, it has been enlarged to provide all power needed for the manufacturing processes.

While considering the addition of the new No. 5 machine, Northern was working toward the abatement of spent sulphite liquor. The first mill in the country to announce plans for a possible solution to the effluent problem, Northern expects to install a burning process which should reduce pollution effects of liquor some 40 or 45 per cent. The system is expected to cost about $1,500,000 (Cf. THE PAPER INDUSTRY, Jan., 1951, pp. 1056-7).

In 1929, the first paper machine installed at Northern was taken out of service—not until 1950 did a new No. 1 machine go into service. It had been in operation only a few months when Northern began making plans for the installation of the new Yankee type machine recently put into production.

New Beloit machine

The new No. 5 machine, one of the largest Yankee type crepe toilet tissue machines in the world, has a 172-inch wire designed for a 162-inch trim; the Yankee dryer is 12 ft. in diameter, and can operate with 125 psi steam. Its maximum speed is 2000 fpm; thus far, it has nearly attained the average speed of 1650 fpm desired for it. The new machine is expected to turn out 48 tons of tissue per day.

Saveall trays are of stainless steel as is the forming board which has micarta lips. An Oliver rotary vacuum saveall reclaims fiber from white water. Five table rolls are of the dandy type and five are rubber covered. Deflectors are located between the table rolls. Four lattice type stainless steel suction boxes are employed. Wire return rolls are rubber covered and with the breast roll are equipped with oscillating doctors. The wire is guided by the new Beloit air operated automatic wire guide. Bottom couch roll is grooved while the top couch roll is rubber covered.

Press section and dryer

Both suction presses are designed for high nip pressure and are air loaded. Each felt passes through a pair of wringer rolls. Four Nash pumps provide vacuum for suction boxes, couch and press rolls.

A Midwest-Fulton steam and condensate removal system using thermal compression is used. Lubrication system is by Bowser and the electric drive was installed by General Electric. J. O. Ross Engineering Co. built the hood and ventilating system for the Yankee dryer.

All three doctors on the dryer are air loaded and the creping doctor has adjustable blade projection. The open side calender has two sets of rolls separately controlled by air pressure. This is followed by an improved transfer type reel. A Beloit tape type unwinding stand is synchronized with a double drum winder and slitter.

The company has housed the new machine in a modern building which adjoins the regular mill. Three stories in height, 505 x 100 ft., the building is of structural steel finished with a red brick exterior. Glass block windows surround the entire outside walling; the interior is finished in straw colored glazed tile.

New machine room

The building is divided into three sections—one for office and storage space and for the pulp beaters—the machine room to house the new machine with space provided for a possible future machine—and finally, the converting, storage and shipping section. New converting machinery has already been installed. The new carloading shed accommodates four freight cars, thus allowing the shipping department to load fourteen cars simultaneously inside the building.

All new building sections incorporate improved ventilation systems and other factors that make for efficient, safe and pleasant working conditions. H. W. Gochnauer, Northern's chief engineer, and his staff directed the erection of the new building in which the machine is housed, and also the actual installation of the machine itself.

Do you know what is patentable?

Not your ideas—not scientific principles . .
Find some answers in these reviews of recent law suits

LEO T. PARKER
Attorney at Law

▶▶▶ A READER WRITES: "Last week a court ordered us to pay $18,000 damages to a patentee on the grounds that we are infringers because we made and used the patented device in our paper plant. We did not manufacture this device to sell but only made it for our own use. Please assist us by giving your version of this unfair decision."

Modern higher courts consistently hold that a patent is a "grant" by the United States Government to an inventor of a new device, method, process or compound. The inventor is given the exclusive right for 17 years to *make, sell,* and *use* the invention. After the 17-year period has expired, anyone can without liability, manufacture, sell, or use the invention. This is so because contrary to general belief an inventor *cannot* renew a patent.

On the other hand, anyone who without authority of the patentee either makes, uses, or sells an infringing device is liable for the infringement. Hence, the court decision holding the reader liable in damages for merely making a patented device for his own use, and not for sale, is not an "unfair" decision, but fully conforms with our patent laws.

What is patentable?

Our present-day higher courts consistently uphold old and established law as to what is and what is not patentable. In other words, certain "things" are not patentable. The following things are *not* patentable: A mere idea, a scientific principle; a mere result, or function; a property of matter; an aggregation of old parts; a mere system for doing something; things having an immoral object; things created by mere "mechanical skill"; all devices that are inoperative; all devices that are not both new and useful. See American, 142 Fed. (2d) 800; and Kenyon, 152 Fed. (2d) 1006; Heritage, 150 Fed. (2) 554; and Brait, 154 Fed (2d) 123.

Modern higher courts hold that a valid patent cannot be obtained on an invention comprising scientific data.

For illustration, in Davison Chemical Corporation v. Joliet Chemicals, Inc., 179 Fed. (2d) 793, the testimony showed facts, as follows: Silica gel is a hard, transparent substance with ultra-microscopic pores, possessing ability to absorb moisture from the air, making it useful as a desiccant. It has other commercial uses in the paper industry where absorptive purposes are desired and where catalysts are useful. Some commercial uses necessitate very small pores in the physical structure while for certain others larger pores are desirable. All this was common knowledge when one Connolly applied for a patent. The industry was then manufacturing silica gel by mixing sodium silicate with an acid under violent agitation, allowing the resulting product to set, breaking it into small pieces, washing it free from acid and salt and drying it at a fixed temperature. Connolly discovered for the first time that a definite relationship exists between the temperature of the wash water and the porosity of the final product. He found that the higher the temperature, the lower the density. He obtained a patent on this invention.

The higher court held the patent invalid as involving merely a scientific fact. The court said:

"It is one thing of course to discover a scientific fact, a law existing in nature, and quite another to invent a means of making that discovery useful. . . . He who discovers a hitherto unknown scientific fact or law of nature has no claim to a monopoly of it. . . ."

For comparison, see the late case Application of Norris, 179 Fed. (2d) 970. This court held that although a chemical combination is valuable as an intermediate for the production of keto nitriles and esters by hydrolysis, amino acids, diamines and other products used in the paper industry, the invention is not patentable despite its newness and usefulness. Here the testimony showed that it was isomeric with well-known compounds and did not have unexpected characteristics or properties. Hence it is a scientific principle and not patentable.

Must be new

It is well established law that a patent will not be issued on an invention affecting the paper industry which is not new.

For example in Eger Patent Appeals No. 5707, 184 Fed. (2d) 193, the testimony showed facts as follows: One Eger filed an application for a patent on a flexible, fibrous sheet of paper impregnated with an unvulcanized copolymer of butadiene with styrene, acrylonitrile, isobutylene, or methacrylates. The ability of the paper to resist cold is of great importance in connection with the locker industry for packaging foods and other perishables for long storage at low temperatures.

The inventor asked for patent claims and protection in the use of a butadiene copolymer wherein the copolymerizing agent such as styrene is present to the extent of 35% to 70% of the weight of the copolymer, and in saturating the fibrous web with such copolymer to the extent of 40% to 60% of the weight of the web.

The higher court refused to allow a patent to the inventor containing this claim in view of prior patents as follows: Konrad 2,335,124, Nov. 23, 1943; Fowler, 2,351,498, June 13, 1944.

For comparison, see Southland Paper Mills v. Marzall, 183 Fed. (2d) 976, wherein it was shown the Southland Paper Mills brought suit against the Commissioner of Patents to obtain a patent for a process consisting of addition of alum to water used in cooling log-grinding part of pulp-making machinery at the early stage of the process, and the inventor substituted Barium for alum in certain stages of the process.

The higher court held that the Commissioner of Patents need not grant the patent since the testimony showed that although adding alum in the process of making pulp is known to be effective in eliminating trouble caused by the pitch in southern pine, yet Barium had previously been tried in the process, and alum had been used at later stages in the process, for the same purpose but with much less effect.

However, since the invention was not new the United States Court of Appeals refused to allow the patent, saying:

"The variation that appellant (Southland Paper Mills) seeks to patent produces excellent results. But since the use of alum to counteract pitch was well known in the art, we cannot say that the Patent Office was unreasonable in finding there was no invention in substituting it for Barium in the grinder."

New idea important

In some respects our patent laws are disadvantageous to inventors. For illustration, our patent laws clearly provide that an invention must be *new* in the whole world, otherwise an inventor *cannot* obtain a United States patent. This is not the law in other countries but the United States patent laws clearly specify that no patent will be issued on any invention previously patented, used or described in a magazine or newspaper, *in any country of the world.*

The reason for this law is the "purpose" of our patent laws. The United States Patent Laws are not, as the majority of persons believe, to enable inventors to get rich quickly. Our patent laws in fact were formulated to *create interest* in inventors to encourage them to invent new and useful things. Hence, the patent laws originally were intended primarily to benefit the public by affording our citizens the opportunity to acquire new things. Although the public must pay the price demanded by the owner of a patent for a period of 17 years, after the expiration of this period the patent may be freely and unrestrictedly manufactured and utilized by the public without further payment of royalties. Thus, by virtue of our patent laws, the public has free rights and privileges of all inventions after the inventor has for a 17-year period received remuneration for having given something of value to our citizens.

New results

As above explained an inventor may obtain a valid patent on an invention which produces *new results,* although certain of its elements are well known.

For example, in Application of Meyer, 178 Fed. (2d) 931, it was shown that an inventor named Meyer applied for a patent on an invention entitled "Process of Treating Yellowish or Off-White Materials to Obtain a White Appearance."

The application relates to a process of treating paper and pulp products, having a yellowish or off-white tint, so as to obtain a pure white appearance. The patent application explained that the materials may be treated at any stage of their manufacture, or subsequent thereto, by contacting them with a solution of a blue fluorescent compound of the coumarin group, preferably umbelliferone or methyl umbelliferone and aliphatic or aromatic derivatives thereof. The specifications of the inventor also stated that the solution preferably contains a small amount of mild alkaline material which facilitates the solution of the compound and increases the fluorescence. The fluorescent material may be used simultaneously with a washing operation in which soap or other detergent is used, or preferably following a washing or a rinse. The solution comprises 10,000 parts by weight of water, about 24 parts of borax and one part of methyl umbelliferone. A "claim" reads:

"1. The process of treating articles, substances and materials having a yellowish off-white tint, which comprises contacting the same uniformly with a solution of a compound of the coumarin group as the only material to affect the characteristics of the articles, substances and materials being treated, and which compound when dissolved, produces a blue fluorescence whereby the yellowish off-white tint is eliminated and a pure white appearance is obtained."

Although the Patent Office Examiner refused to issue a patent on the invention, the United States Court of Customs and Patent Appeals reversed the verdict, saying:

"It is reasonable to conclude that appellant (Meyer) was the first to discover that a blue fluorescent compound could be used in order to whiten yellowish or off-white material."

Hence, in this case, although the elements and materials were well known, the obtained results were new and useful. Therefore, the invention is valid.

Deception not allowed

Considerable discussion has arisen from time to time over the legal question: Can a person always use his own name in his business? According to a late higher court decision the answer is no. In other words the higher courts hold that no person may use his own name for the purpose of appropriating the business or good will of a competitor nor may he resort to any artifice or contrivance in the use of his own name for the purpose of misleading the public as to the identity of his goods or business.

For example, in Osborn Paper Co. v. Carrold Osborn Paper Co., 234 S.W. (2d) 614, the testimony showed facts as follows: In the year 1907, a corporation was incorporated under the name of "Osborn Paper Co." In 1949 a man named Carrold Osborn incorporated a business under the name of "Carrold Osborn Paper Co., Inc." The Osborn Paper Co. sued the Carrold Osborn Paper Co. contending that use of the name "Carrold Osborn Paper Co." was confusing to the Osborn Paper Co.'s customers and that use of name was calculated to and would deceive or confuse the public.

The higher court agreed with this contention, saying:

"We find the law to be that the right of a man to the use of his own name has its limitations. Generally speaking every person has the right honestly to conduct his own business under his own name, but he must use that name with due regard to the rights of another person or corporation having the same name."

Considerable discussion has arisen from time to time over the legal question: "When can a trade-mark similar to another trade-mark or trade name be registered in the United States Patent Office?" The answer is: Only when the public will not be deceived.

For illustration, in Safeway, 75 F. Supp. 900, and 172 Fed. (2d) 649, it was shown one Warren Co. registered and adopted a trade-mark "Safeway" for paper toilet seat covers. The Safeway Stores, a large chain of stores, filed suit and asked the court to refuse registration of the trade-mark on the ground that the public would be confused and deceived into believing that the Safeway Stores manufactured and sold the toilet seat covers.

The lower court refused to agree with this contention and held that Warren could register his trade-mark. However, the higher court reversed this verdict, holding that use of the trade-mark

"Safeway" on paper products by Warren would confuse and probably deceive the buying public.

Hence, in view of the well settled law it is quite apparent that no one infringes a trade-mark unless the testimony shows conclusively that the public will be confused or deceived. However, as previously indicated, a patent is infringed if anyone makes, sells or uses a device, process, or composition described in one or more "claims" in the patent.

Make claims broad enough

On the other hand, it is well established law that a patentee, and owner of a patent, is restricted absolutely by the "claims" in his patent. Hence, it is advisable that those who file applications for patents be certain *not* to allow an Examiner in the Patent Office to force or induce you or your Patent Lawyer to limit claims to which you are justly entitled. If you do so, you forever lose your rights to broad claims.

For example, in Exhibit Co., 62 S. Ct. 519, the Supreme Court of the United States said:

"As the question is one of construction of the claim it is immaterial whether the examiner was right or wrong in rejecting the claim as filed."

Also, see the late and leading higher federal court case of Dixie Cup Company v. Paper Container Manufacturing Company, 169 Fed. (2d) 645. The facts of this case are as follows: The Paper Container Manufacturing Co. owns patents on paper manufacturing devices. One patent was allowed with *limited* claims. Since the Patent Office Examiner refused to allow broad claims, the inventor's lawyer amended the original claims to limit or confine the claims to a machine which severs blanks from the strip "by repeatedly cutting off the end of the strip." This was necessary, or at any rate the patentee's lawyer so thought, to distinguish the claims and thereby induce their issuance.

In subsequent litigation, because of this limited claim, the higher court refused to hold that the patent was infringed whereby the Paper Container Manufacturing Company was defeated in its suit for heavy damages for infringement of the patent.

The lawyer representing the Paper Container Manufacturing Co. argued that actually the patent should have contained claims sufficiently broad to justify a verdict for infringement. The higher court refused to agree, and said:

"This argument if accepted, is of no value to the plaintiff (Paper Container Manufacturing Co.) because it is now immaterial. It was an appropriate argument and evidently was made to the patent office when the claims were being considered. Whether that office properly appraised the prior art in its consideration and rejection of the claims as originally proposed, or whether the patentee properly acquiesced in the ruling of the examiner with reference to Ristow and amended the claims to meet such ruling is now beside the point."

Again see Exhibit Supply Co. v. Ace Patents Corporation, 315 U.S. 126. In this case had Claim 7 been allowed in its original form it would have read "carried by the table." By striking that phrase from the claim and substituting for it "embedded in the table" the patentee restricted his claim.

In subsequent litigation the Supreme Court of the United States refused to award damages for infringement to the patentee, saying:

"By the amendment he (patentee) recognized and emphasized the difference between the two phrases and proclaimed abandonment of all that is embraced in that difference. The difference which he thus disclaimed must be regarded as material, and since the amendment operates as a disclaimer of that difference it must be strictly construed against him. As the question is one of construction of the claim it is immaterial whether the examiner was right or wrong in rejecting the claim as filed. It follows that what the patentee, by a strict construction of the claim cannot now, by liberal construction, secure to the inventor the full benefits, not disclaimed, of the claims allowed."

For comparison see another patent decision in Dixie Cup Co. v. Paper Container Manufacturing Co., 169 Fed. (2d) 645. Here the higher court held the Paper Container Co. entitled to recover $154,027.00 damages from the Dixie Cup Co. for patent infringement of use of its Original Spiral machines. The Master on account of such infringement allowed as damages what he found to be a reasonable royalty in the amount of $21,608.20, based on 5% of the selling price of the Dixie Cup Co.'s cups, and disallowed deductions in calculation of its profits in the amount of $29,734.19. These two items total $51,342.39. Based on this award, the Master recommended treble damages in the amount of $154,027.17 which recommendation was approved by the lower court. The higher court approved the damage allowance, saying:

"The defendant (Dixie Cup Co.) while admitting liability on account of the Original Spiral machines, disputes the amount of damages awarded, and particularly the award of treble damages. The controversy concerning the award of damages as made by the Master revolves in the main around the testimony of two expert witnesses, one offered by the plaintiff and the other by the defendant. We think no good purpose could be served in relating or discussing the conflicting theories advanced by these expert witnesses as to the proper basis for the making of an award."

It is also important to observe that the fees to lawyers in this patent infringement suit amounted to $141,075.00. Hence in this case the difference between a "good" claim and a weak claim in the patent was near $300,000.00.

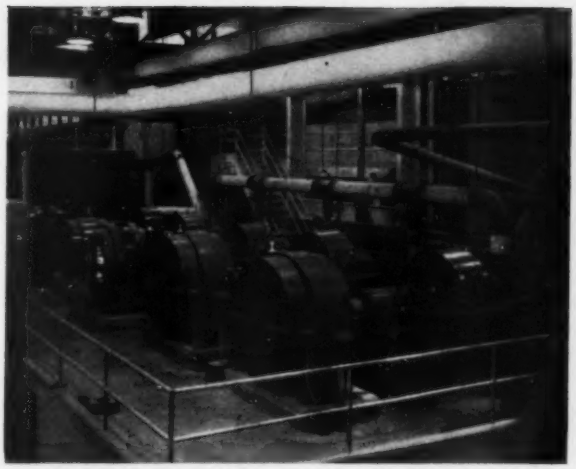
Rights of inventors

Modern higher courts consistently hold that an inventor may "invent" new devices, processes, etc. which he may patent, and also he may "invent" new words for explaining the uses, operation and construction of his patented product.

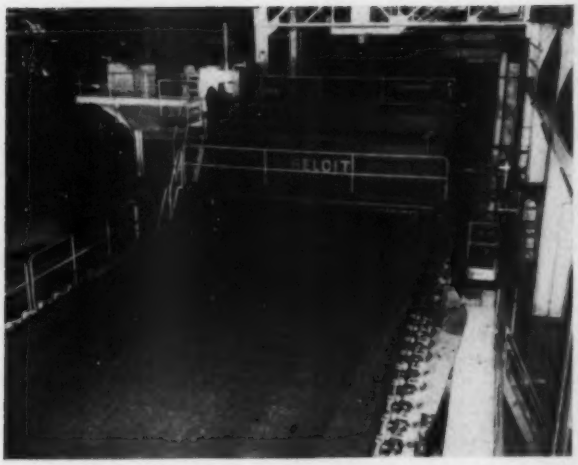
The reason the law is thus presently established is because the courts *always* endeavor to afford the inventor the protection *to which he is entitled.* In other words, an inventor cannot be penalized simply because he fails to explain his invention, in the body of his specifications, in terms thoroughly understood by all persons. This advantage of law is particularly important when it is considered that inventors, who in anticipation of filing an application for a patent, may record or explain the invention on documents intended to be utilized at a subsequent date to establish priority and validity of the patent.

Nevertheless, as above explained, the inventor is held strictly to the claims in his patent. Under all circumstances a patentee is *bound by his claims* and he cannot in an infringement suit, ask for a broader construction than listed in his claims even though he *may* have been entitled to broader claims when the patent application was in the course of prosecution. (156 F. 967.) The court never will expand a claim or claims in favor of a patentee, and the inventor will be protected *only according to the terms of his claims,* (109 F. 644) (105 F. 978) (117 F. 830) (119 F. 874) (212 F. 720) and it does not matter how manifest the fact or extent of the mistake may be shown to have been in "wording" the claims incorrectly. (183 U. S. 591.) And again, the specification cannot be read into the claims for the purpose of broadening them (184 F. 609). In other words, a claim is a *definition* of the invention and it is necessary when proving infringement of a patent to prove infringement of a claim (263 F. 706) and also it must be proven that the particular thing alleged to be infringed is described in the specification and illustrated.

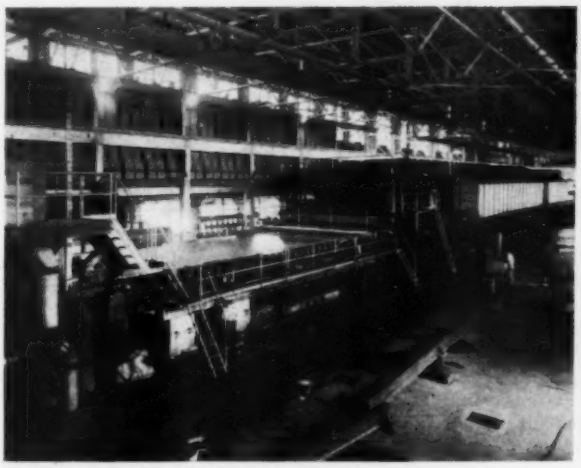
Another important point of the law is that no one is liable for infringement of a patent applied for, but not issued. Hence, the markings "Patent Applied for" and "Patent Pending" on an invention or product merely indicate that the inventor has applied for a patent, which has not been granted or issued. The infringer is not liable in damages for infringing such an invention.



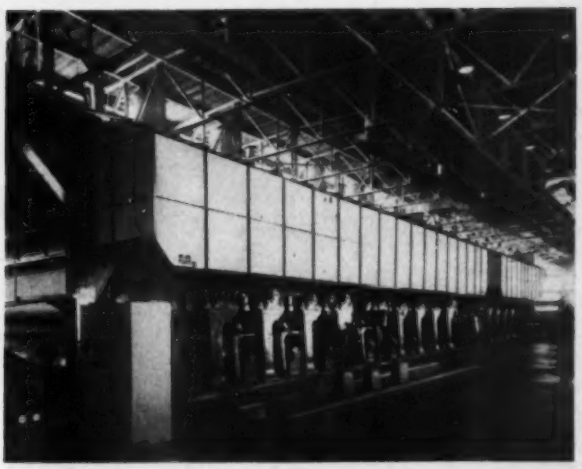
Sutherland refiners—five of them



Pressure headbox, Oliver saveall on mezzanine



Beloit paper machine, Mason-Neilan controls



Jamar-Olmen hood over dryers

Highlights of Camp's expansion program

▶▶▶ ANOTHER MILESTONE of progress was passed recently when the 63-year-old Camp Mfg. Co. at Franklin, Va., started its new No. 3 paper machine. Basically a lumber manufacturer, the company built its kraft pulp and paper mill in 1937. With the starting of its new Beloit paper machine, the company completed the $6,000,000 expansion program started two years ago.

Major new installations are the paper machine and stock refining system, recovery plant, power boiler, and turbogenerator. Many other additions and improvements were made throughout the mill. Furthermore, modernization and improvement will continue to be carried out. For instance, a new semichemical pulp mill is expected to start up sometime during the year. Merrit, Chapman and Scott have handled the design and construction of this expansion program.

Some of the details of the expansion program are outlined.

New paper machine

Built by Beloit Iron Works, the new machine is designed to make 170 tons per day of lighter weights of kraft paper —bag, wrapping, gumming, waxing, etc.

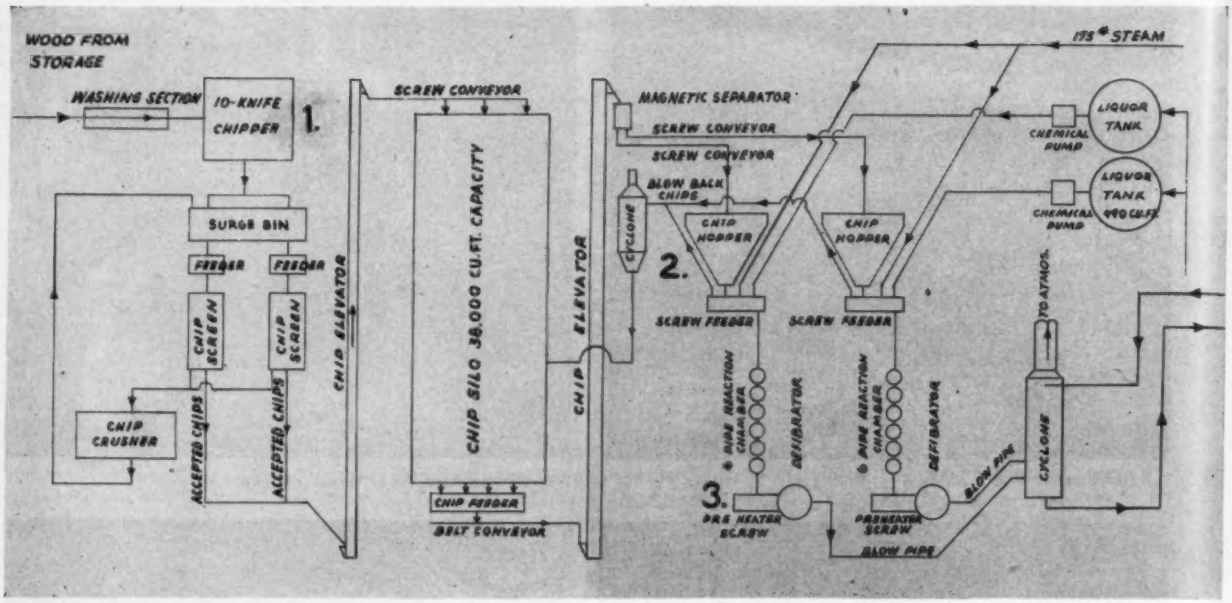
Fourdrinier wet end—Pressure headbox, air loaded, stainless steel lined; wire, 226 in. wide by 124½ ft. long; 26 aluminum table rolls with Timken antifriction bearings; seven flat oscillating suction boxes; 30 in. breast roll; 36-inch suction couch, 30-inch secondary couch or wire turning roll; stainless steel save-all trays; Lodding doctors on breast roll and outside wire return rolls.

Press section—Equipped with suction press pickup roll and first press transfer roll; first press has bronze suction bottom roll and rubber-covered top roll; second press is a cloverleaf type dual press with 60-inch Stonite-covered center roll and two 36-inch rubber-covered suction rolls; pickup felt and the two press felts equipped with Vickery felt conditioners; eight Nash pumps supply vacuum for suction boxes, couch, suction press rolls and felt conditioners.

Dryers—31 paper dryers and 6 felt dryers, 60 inches diam., operated at 50 psi (designed for 125 psi); equipped with SKF antifriction bearings; enclosed drive gears; lubricated with a Bowser pressure system. Dryers arranged in three sections—two sections of ten dryers, followed by a breaker stack, then the last section of 11 dryers; Lodding doctors; top and bottom dryer felts. Jamar-Olmen Co. hood and ventilating system.

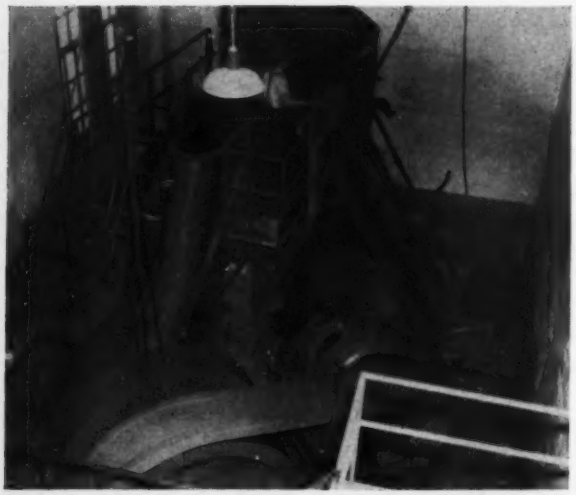
Calender, reel and rewinder—Beloit

(Concluded on page 294)



Flow diagrams and photographs show how—

Bathurst makes

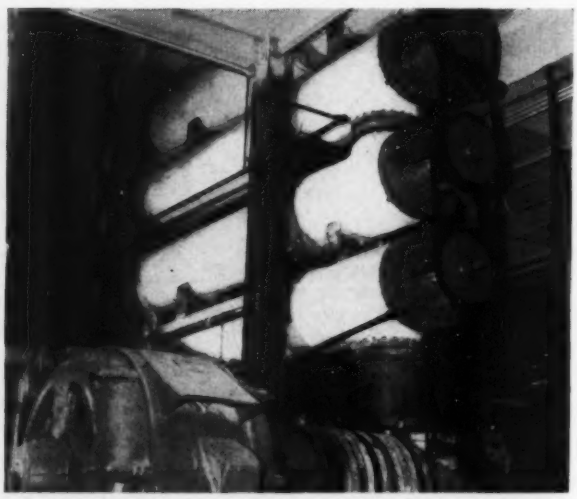


1 HARD-WOOD LOGS are reduced to chips in a Carthage 10-knife chipper

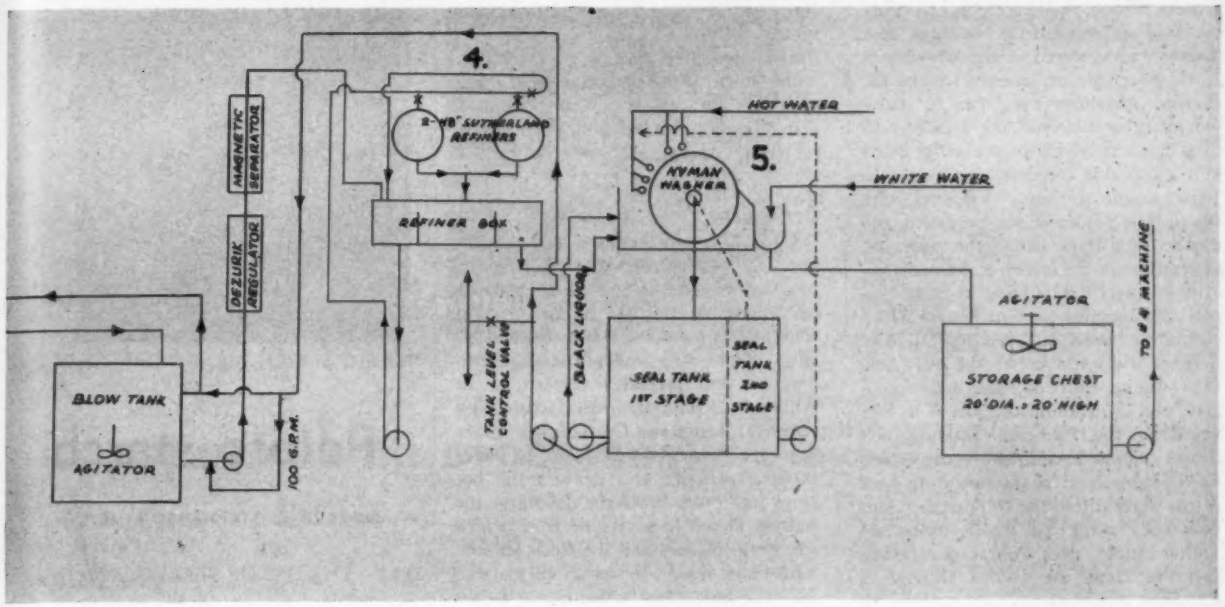
▶▶▶ Utilization and conservation of natural resources for many years have been primary concerns of Bathurst Power & Paper Co., Ltd., Bathurst, N.B., Canada. Hardwood is readily available in the New Brunswick forests, but the supply of available softwoods is not inexhaustible. Quite some time ago, Bathurst officials began to experiment for a commercial usage of hardwoods that would add desired tonnage to the Bathurst mill without depleting the softwood supply.

Research began; within a short time it

2 CHIPS are fed from hoppers to the screw feeders of the Chemipulper continuous digesters



3 SEMICHEMICAL cooked chips are discharged from the B-K reaction chamber of the Chemipulper to the Asplund defibrator



semichemical pulp from hardwood

became apparent that semichemical treatment of hardwood would result in pulp which could be converted into rigid corrugated board. Since Bathurst's integrated operations include two plants maintained for the manufacture of corrugated shipping containers, the production of corrugated board fitted well into the over-all Bathurst pattern.

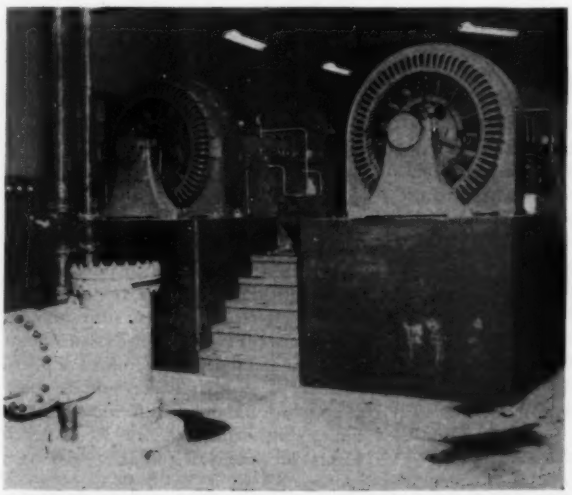
The BCM Mill (so titled for both Bathurst Conservation Measure and Bathurst Corrugating Medium) was completed in January. The first Canadian mill constructed for the manufacture of pulp for corrugating board by a continuous process, it was designed and put up by the Bathurst construction and engineering staffs.

The mill was planned for a maximum production of 200 tons per day, but the demand for shipping boxes has as yet only required an output of about 150 tons per day.

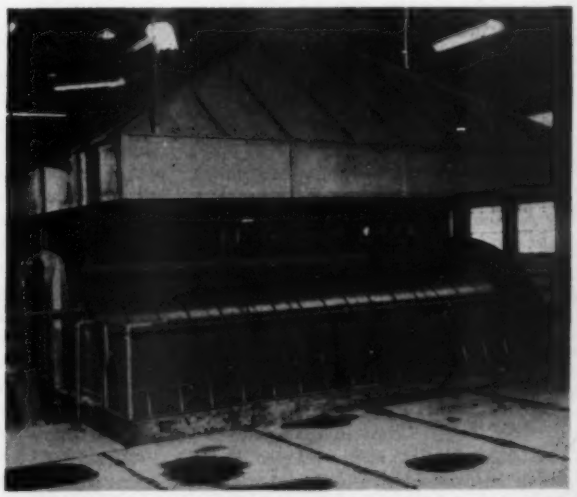
Bathurst officials have found that the production method outlined in this article has resulted not only in a new use for hardwoods but in a 9 pt. sheet which is distinctly superior in quality to previous boards the company has manufactured; rigidity and flat crush tests of the board made from semichemically cooked hardwoods are nearly double those previously recorded by the company, although still greater test records may be achieved as those working with the system become more and more familiar with it through experience.

Wood processing

All hardwood species in the New Brunswick area — principally poplar, beech, maple and birch—are used in the



4 HOT BROWN STOCK from the blow tank is refined by two Sutherland refiners



5 REFINED BROWN STOCK is washed in a two-stage Swenson-Nyman rotary vacuum washer

process. Wood is delivered by truck to the mill in either four or eight foot lengths and is stored in regular piles or added direct to the conveyor feeding the chipper. Although wood can be hand-fed into the conveyor, the greater portion is fed by means of a crawler crane into a movable feeder which keeps the Jeffrey cable conveyor supplied with wood. The feeder is self-propelled and moves on a track beside the conveyor. One section of the conveyor, immediately after it enters the building, consists of a specially designed washing system which cleans the wood and removes all dirt.

After the wood enters the 50 x 200 foot building constructed of hollow concrete blocks made on the job, it is conveyed to the Carthage 10-knife belt driven chipper, located in one corner and on the same level as the operating floor of the plant. From the chipper the chips flow to a surge bin which feeds two Dillon triple deck vibrating screens. Oversize chips are passed through a Carthage rechipper and returned to the surge bin. Accepted chips are lifted by means of a Jeffrey bucket elevator operating at the rate of 12,000 fph and discharged into a Jeffrey spiral conveyor which distributes the chips evenly into a concrete chip silo having a capacity of 38,000 cubic feet or sufficient for about 18 hours of operation. The silo is emptied by means of a rotary vane chip feeder which discharges the chips into a belt conveyor feeding a second bucket elevator.

Semichemical cooking

The bucket elevator delivers the chips to a Dings magnetic separator which removes tramp metal, and then to screw conveyors which charge the two chip hoppers which supply the two Chemipulpers furnished by Paper & Industrial Appliances, Inc.

Chips from the hoppers enter a variable speed screw feeder at the operating floor level. As the plug of chips is formed, chemical in the form of a modified kraft liquor is proportioned in by a Milton-Roy pump. At the same time, steam is injected to bring the combined chips and chemical to a pressure of 150 lb. psi. Proper provision is made at this point so that steam will blow back into a cyclone and not give rise to a hazard on the operating floor, should any stoppage in the flow from the hoppers, or any other temporary difficulty within the screw feed, occur.

The mass of chips and chemical solution at cooking pressure drops to a six-pipe, one-way-flow BK reaction chamber manufactured by Paper & Industrial Appliances, Inc. Each pipe or reaction chamber is 24 inches in diameter, 19 feet long, and is stainless steel clad. Provision is made for the addition of two other pipes, should they be required in the future. Within each pipe is a worm conveyor driven by a Reliance drive and synchronized with all six pipes so that the reaction time may be varied within wide limits. Thus, the chips pass along each pipe and drop to the next at such a rate that the cooking time or the time of passage through all six pipes can be closely controlled.

Defibering

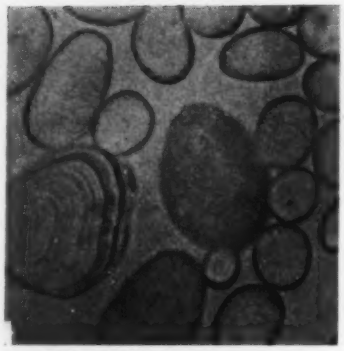
Chips in this process are cooked semi-chemically so that they must be defibered mechanically at the end of the pulping operations. At the end of the reaction time in this continuous system the softened chips—still under cooking temperature and pressure—are fed to an Asplund Defibrator, manufactured by American Defibrator Co. This is a rotary disc-type refiner which operates under cooking pressure and defibers the hot chips into pulp. From the defibrator the pulp is blown to a cyclone from which the steam escapes and the stock, diluted with black liquor, passes to an agitated tile-lined blow chest where it is at a consistency of six per cent. As previously mentioned, there are two identical pulping units discharging into the blow chest, located at ground level.

Hot stock refining

From the blow tank the pulp is pumped through a DeZurik pressure type consistency regulator, a second Dings magnetic separator, and arrives again at the operating floor level. Here stock is passed through two Sutherland refiners arranged in parallel with 48 in. discs driven by 450 hp. motors. Refining action at this point is the same as the hot brown stock refining process originally developed by Bathurst in its kraft mill. After the refiners, pulp is washed on a two-stage 9 x 16 ft. Swenson-Nyman washer and then dropped to a 6000 cu. ft. storage tank, manufactured by Stebbins Engineering. At this point stock is ready to be pumped to the board machine.

All important operations in the plant —such as chip and chemical feed, refining, and pulp washing—are located on the operating floor so that the operators may have easy access to them. Additionally, the entire plant is under push-button control from the same floor. The operating panel with recorders and controls was manufactured by the Foxboro Co. Controls and layout of the plant are such that the entire operation is carried out by three men per shift plus the chipper man on one shift only.

In the paper machine room, the BCM stock is mixed with just sufficient kraft pulp to give the sheet some tensile strength on the machine and is then refined in one Jordan and two 48-inch Sutherland refiners operating in parallel. After refining, the stock is made into corrugating board on a Walmsley fourdrinier machine trimming 146 inches.



POTATO STARCH, Fig. 1

Potato starch

EDWARD E. STEPHENSON, JR.*

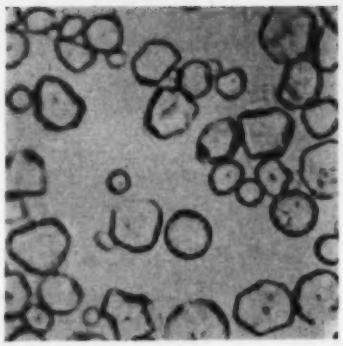
▶▶▶ THE USE OF STARCH in papermaking is virtually as old as the art of paper fabrication itself. The history of the industry shows that Chinese and Arab papermakers were acquainted with the use of starch for the improvement of writing qualities of paper as early as 700 A.D. Even prior to that date, and perhaps before the making of the first sheet of true paper, Egyptian and Roman artisans were using wheat flour in the sizing of papyrus to prepare the surface of this paperlike product for the inks then used *(1)*. Since these primitive times, use of starch has increased until it is now one of the major non-fibrous raw materials in many grades of paper, and the paper industry has become one of the largest single industrial consumers of starch in this country.

Potato starch in the United States

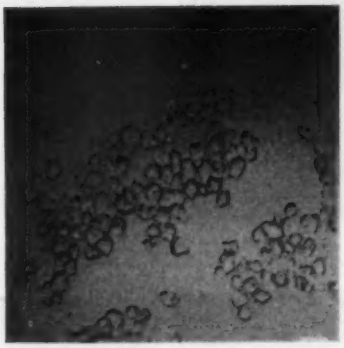
The United States has large areas suitable for the growth of cereal grains which may be diverted to the manufacture of starch and starch products. This fact kept potato starch in a non-prominent, if not an obscure, state in this country until our present decade. In Europe, where climatic and economic conditions favor the growth of tuberous plants, potato starch long has held a position of dominance in the field of commercial starches used by industry.

Within the past eleven years, however, the United States suddenly has found itself a nation with potato crops in excess of the demand for edible potatoes. Diversion of these surplus products to useful channels has been one of the prominent achievements of modern chemurgy. A revitalization of the long-established potato starch industry and the establishment of a new set of starch plants in potato-rich Idaho have been

(*) B.S. Ch. E. Purdue, 1949, student Pulp and Paper Technology, Western Michigan College, Kalamazoo, Mich.



CORN STARCH, Fig. 2



RICE STARCH, Fig. 3

TABLE I—Average size of native starch granules in microns (6)

Starch	Average	Minimum	Maximum
Potato	40-60	15	100
Corn	15	5	25
Tapioca	15	5	35
Wheat		2	35
Sago		20	60
Arrowroot	50	15	65
Rice	5	3	8
Sweet Potato		10	25

in papermaking processes

A survey of current literature on the place of potato starch in the paper and paperboard industry; part I of two parts

major steps toward full utilization of the potato crop.

Surplus potatoes yield starch

The result of this revitalization and other factors well explained by McMillan *(2)* has been the production of an American potato starch of high and consistent quality at a price directly competitive with the other available starches. This production, according to Barnett, *(3)*, includes a manufacturing capacity of 20,000 tons in Maine mills and 32,000 tons in Idaho plants for the year of 1949. Consumption in that year was estimated by the same author as 29,000 tons, showing production capacity which, with sufficient supply of the raw material, potatoes, and sufficient demand for the manufactured product, starch, could have been expanded to a considerable extent.

The paper industry has used increasing amounts of potato starch in recent years. According to Shallcross *(4)*, imported and domestic potato starches were used by the paper industry to a very limited extent prior to this decade. Only 14 tons of potato starch were used by the industry in 1933, but expanded use was noted as follows: 61 tons in 1935, 165 tons in 1936, and 168 tons in 1937. Barnett *(3)* reports an unusual growth in the consumption of potato starch by the paper industry and estimates a consumption of 10,750 tons at the time of this publication. Thus, the role of the paper industry as a consumer of potato starch has grown from humble beginnings to a position of considerable importance.

This growth has been due to certain unique properties of the potato starch which are of great interest to the papermaker in times of an adequate and economically attractive supply of that starch. Therefore, re-examination of potato starch as a raw material for increased use in papermaking seems to be indicated.

A re-examination of the characteristics of potato starch will consist mainly of a comparison with other starches. Since starches are available in many forms on the commercial market, a general classification of starches and modified starches is presented.

Classification of starches

The first step in classifying starches is the consideration of natural origin, be it potato, arrowroot, corn, wheat, rice, rye, or any other conceivable botanical source. In more general terms, starches are sometimes grouped as root or tuber starches on the one hand, and seed or cereal starches on the other. In this classification, potato, tapioca, arrowroot and other plants where the starch bearing tissue grows underground are listed as tuber starches, while corn, wheat, rice, rye, etc., are called seed starches. Starches from these various sources have characteristic average particle measurements as shown in Table 1, as well as distinguishing morphological characteristics as shown in the illustrations chosen from the work of Sjostrom *(5)*.

In the illustration of microscopic appearance of starches, Figure 1 represents native potato starch in a water suspension. Figure 2 shows typical corn starch granules, and Figure 3 is a rice starch suspension. Swollen, pasted, or gelatinized potato starch is shown in Figures 4 and 5. This state is also shown by Figures 6 and 7. The latter illustrations are taken from the work of Seck and Brem *(7)* and are photographs of an isolated stained granule of potato starch before and after heating to the gelatinization temperature.

All starches may be modified either by chemical or physical means so that they will be more suitable for certain uses. The commercially important conversions may be classified as acid hydrolysis, oxidation, enzyme hydrolysis, heat dextrinization, and preparation of derivatives such as ethers and esters of starches.

In normal trade channels, the starch derivatives are treated as a separate group and sold under names indicative of the extensive chemical changes brought about. Uses for this special group range from explosives to paint and varnish formulation and will not be dealt with in this article.

The acid converted starches are sold as "thin boiling" starches of various "fluidities" indicative of the viscosity of the converted starch after cooking. For a photograph of an acid converted potato starch, see Figure 8.

The oxidized starches are those starches which have been subjected to an oxidation reaction to modify the internal structure. When the oxidation agent has been sodium hypochlorite, these starches are referred to as "chlorinated" starches, even though the final product does not contain chlorine.

Enzyme converted starches are not sold as such, since the conversion in this case is carried out by the starch consumer through the addition of a concentrated enzyme, an organic catalyst, to the cooked starch paste.

Finally, the heat converted or acid roasted starches are produced by a more drastic reaction with acid in the presence of heat, resulting in the production of dextrins or gums. For an example of acid roasted potato starch, see Figure 9.

Physical modification of starch may take the form of cooking, precooking, dry milling, or blending. The cooking operation is in the hands of the user. In this process, the individual granules of starch are caused to swell, burst, and release soluble components in the presence of hot water. Illustrations showing the microscopic appearance of this process are given in Figs. 4, 5, 6, and 7.

Precooked or "hot roll" starches are mixed with a small amount of water and passed between hot rolls where the granules burst. They are subsequently

Fig. 4—Potato starch, pasted (a)—X 400

Fig. 5—Potato starch, pasted (b) X 400

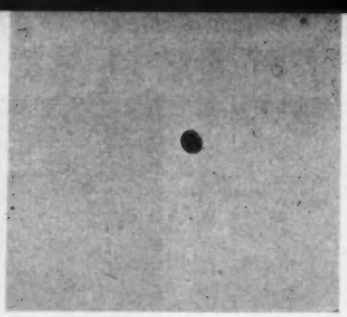


Fig. 6—Stained potato starch granule

Fig. 7—Stained potato starch granule, pasted

Fig. 8—High-fluidity thin-boiling potato starch, pasted—X 400

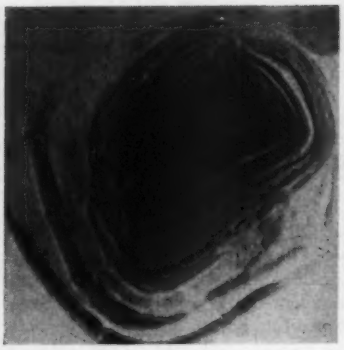


Fig. 9—Potato dextrin, disintegrating in water and glycerol, stained—X 900

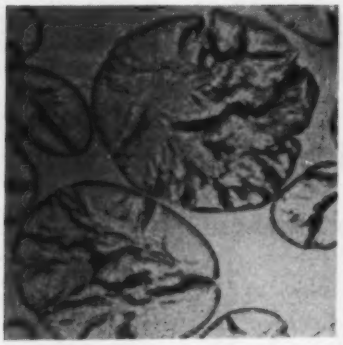


Fig. 10—Dry milled potato starch

Fig. 11—Crushed potato starch granules

dried and sold as "cold swelling" starches since they will disperse readily in cold water. Dry milling achieves much the same effect by mechanical rupture of the dry granules of native starch. Dry milled potato starch granules are shown in Figures 10 and 11.

Blending is a modification in that modified starches or related products are mixed with native starch or with other compounds such as wetting or dispersing agents to produce a mixture of certain desirable properties.

With this background information, one may pass to a consideration of the general uses of starch in the paper and paperboard industry.

General starch usage in paper manufacture

Excellent over-all surveys of papermaking uses of starch are given by Casey *(8)*, *(9)*, and Kerr *(6)*, both organizing the uses of starch along functional lines and giving general requirements for starches in the numerous fields of special application. Liberal use of these sources has been made in the following summary of starch utilization which deals with beater application of starches, tub sizing with starches, application of starches at the calender stack, and use of starches as adhesives.

It is to be emphasized that any overall survey must, of necessity, ignore points which may be of unique importance in certain mills or processes, since each mill has individual problems dictated by layout, location, and operating personnel.

Addition of starch to the furnish for the paper machine, before the formation of the wet sheet on the wire, is usually referred to as beater application. The term beater starch persists despite the fact that many mills prefer to make the actual starch addition at points beyond the beater such as at the fan pump, in the mixing box, or at the head box.

Use of starch in the beater

The use of starch in beater sizing is a highly controversial subject, in which the treatment given to the starch by the paper mill, the time of addition, the location of the addition point, and the retention of starch in the finished sheet, are dominant factors governing the effectiveness of the starch. Starch is added here for the purpose of increasing the bursting strength, increasing the tensile strength, and improving rattle, stiffness and resistance to picking. According to Swanson *(10)*, it is also possible for certain types of beater starch to supplant a part of the beating cycle with no loss in strength characteristics of the finished sheet. This procedure may allow a saving in power and may increase the capacity of mill equipment without additional capital investment.

Swanson also states that beater starch may be useful in laying loose surface fibers or fuzz, improving erasing qualities, and in increasing filler retention. Jayne, Tongren, and Jackson *(13)*, state that the use of soluble starch in the beater may be beneficial in improving the formation of the sheet in addition to the previously mentioned benefits. Steffens *(12)* reviews shortly the literature on starch as a beater additive and emphasizes that trial runs can yield significant results only if they are conducted over a sufficiently long period of time.

Rowland *(13)* presents an extensive and comprehensive analysis of the methods used in starch application in the stock preparation system or at the wet end of the paper machine. His classification of methods is based on the degree of dispersion reached by the starch in preparation for addition to the furnish. He notes that starch is often added to the beaters in native, uncooked, and unmodified form. Successive degrees of cooking and modification range to the maximum of colloidal dispersion.

Approaches to beater application of starches

Addition of dry uncooked starch to the beater is the simplest procedure from the point of view of the papermaker. The effectiveness of starch added in this way, however, may be extremely limited. If the granules remain in the sheet as ungelatinized, discrete particles, they are effective mainly as a filler in the sheet, since only a few of the active polar groups are available to form a bond from cellulose to starch to cellulose.

The fact that this simple addition process is seldom highly effective can be explained by the moisture requirements for gelatinization pointed out by Meyer *(14)*. He states that a fully swollen granule of starch requires 30 to 50 times its own bulk of water to attain this state. This requirement

would make it improbable that complete gelatinization take place in the drier section due to moisture requirements alone. In addition to this, Rowland emphasizes the fact that gelatinization does not take place when a cold starch slurry is brought to a rapid boil in a test tube. With the high machine speeds encountered in modern paper mill practice, it is doubtful that gelatinization would occur in the dryers since temperature elevation is extremely rapid and of short duration. As pointed out by Strasser *(15)*, however, gelatinization of unmodified starch in the dryer may be possible in mills producing heavy board at relatively slow machine speeds.

Cooking of a starch to a degree of swelling somewhat less than the maximum possible prior to its addition to the beater is also discussed by Rowland. He states that the amount of cooking needed to produce partly swollen granules must be correlated with the jordan setting. In this procedure, granules are swollen to a point where they are just ruptured by the shearing action of jordaning. This is said to produce the most desirable increase in strength. Too extensive a stress in jordaning tends to cause an extensive structural breakdown of the starch with a great loss in effectiveness.

Completely cooked starch added to the beaters is relatively ineffective if jordans or other shearing devices are used, since even mild mechanical action tends to destroy desirable properties in completely cooked starches. Use of a toughening agent, such as formaldehyde, with cooked starch has been reported effective in resisting jordaning in this application, according to a patent granted to Rowland and Bauer *(16)*.

Experimental work by Houtz *(17)* has shown that maximum strength can be developed in handsheets at a state of maximum colloidal dispersion which varies according to the natural source of starch. These states of maximum dispersion were found to be about 88C. for tapioca starch, 95C. for corn starch, and 96C. for potato and sweet potato starch. The latter starches, however, had to be held at 96C. for specific times, about 10 minutes for potato starch and about 20 minutes for sweet potato starch.

Recent work, therefore, seems to indicate that addition of fully dispersed starch to the furnish at points between the jordan and the wire without exposure of the starch to extensive shearing action is necessary for utilization of starch in its most effective state. Rowland *(18)* holds a patent involving the addition and precipitation of starch on fibers under this procedure.

TABLE 2—A comparison of starches in beater application (8)

Starch	Mullen lb/in²	Tensile Strength relative	Fold	Ink Resistance seconds
Oxidized	46	13	1800	340
Pearl	33	10.5	500	50
Tapioca	30	10.0	350	90

Rowland also points out that an adequate concentration of an electro-positive precipitating agent, such as alumina, must be present in order to cause the starch to adhere to the cellulose fibers and to prevent excessive loss in the white water.

Another approach to the use of cooked starch is that of Wrede *(19)* who proposes the partial gelatinization of starch in the presence of sodium silicate before addition to the beater. He claims the formation of a tougher film, heat savings in gelatinization due to alkaline swelling of granules, and better retention. Kesler and Black *(20)* claim quantitative retention plus increased strength properties by precipitation of a soap complex of starch on cellulose fibers in the presence of heavy metal ions.

Strength increases due to beater application

Cobb, Lowe, Pohl, and Weiss *(21)* reported that maximum strength characteristics were developed in a sheet by 0.5 per cent retained starch, with one instance of an increase in bursting strength of 35.7 per cent. Corresponding increased resistance to picking expressed in terms of wax numbers were noted with a similar maximum at 0.5 per cent retained starch. Apparently these experiments were performed without the presence of rosin or alum.

Yraola *(22)* reported that the best results in strength improvement were obtained in mill trials upon addition of beater starch in amounts of up to 4 per cent of the dry fiber. He reported wax number increases from 12-14 to 20-23 with the addition of 4 per cent cooked starch in the beater. No retention figures were given; so direct comparison with the results of Cobb, *et al*, is not possible. Yraola also states that this beater application of starch improved the smoothness, compressibility, bending qualities, and gloss ink printing characteristics of the boxboard produced.

Figures presented by Casey *(18)* show a definite improvement in the ink resistance of a sheet sized with 1.8 per cent rosin size when 3 per cent of an oxidized starch is added. Savings in alum and simultaneous increase in bursting strength was noted. Other results obtained in a comparison of an oxidized starch with tapioca and pearl starch are summarized in Table 2, showing that use of an oxidized starch may often be justified despite its higher cost.

The second half of this article will appear in THE PAPER INDUSTRY next month.

Acknowledgment

This survey of current literature was made possible by a grant jointly provided by the *American Key Products Co.*, New York, N. Y., and the *St. Anthony Starch Co.*, St. Anthony, Idaho.

The survey was carried out under the supervision of *Dr. Alfred H. Nadelman*, Head of the Curriculum and Professor of Pulp and Paper Technology at Western Michigan College, Kalamazoo, Mich. The author wishes to express his appreciation for the financial support supplied by the two above mentioned companies and the guidance of Dr. Nadelman.

Illustrations numbered 1, 2, 3, 4, 5, 8, 9, 10, 11 were selected from the work of O. Sjostrom (5). Those numbered 6 and 7 were selected from the work of Seck and Brem (7).

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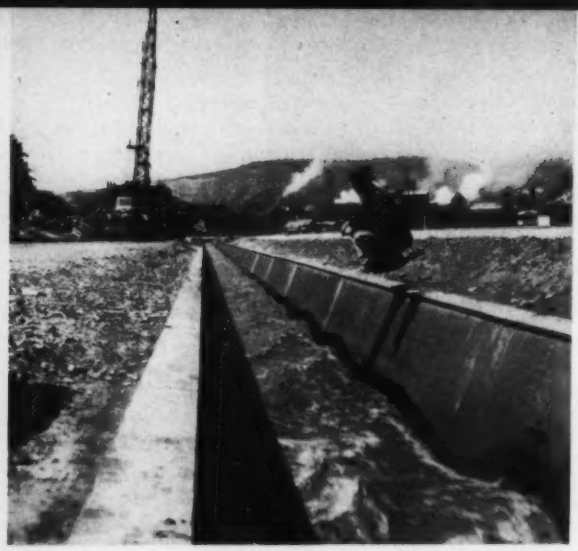
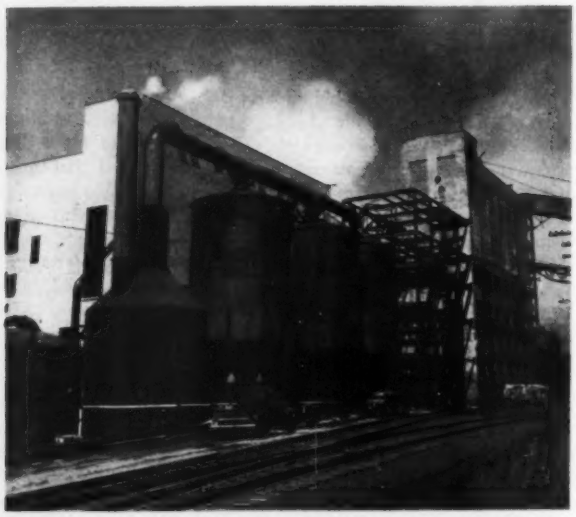


WOOD from storage is floated at about 4 miles per hour in this flume conveyor; about 800 cords per 24 hrs. can be handled

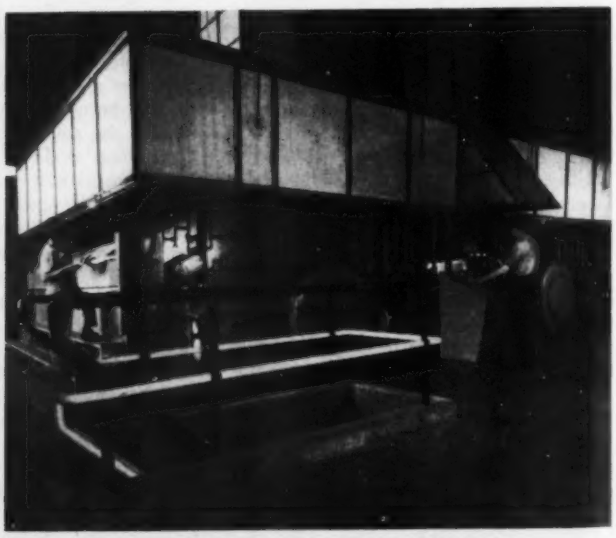
CHIPS are stored in these two steel silos—chip conveying system is operated automatically from the pulp mill control panel

BARKED WOOD is carried 825 ft. from the barkers to the chip house on belt conveyor; rubber belt is 3 ft. wide by 1700 ft. long



PULPING and washing operations take place in the consolidated pulp mill, still under construction at Covington

CHIP FEEDER of M&D continuous digester; R. A. Hooks, pulp mill supt. and C. Smith (left) discuss operation



BROWN STOCK WASHERS—One of the three lines of Impco rotary vacuum washers; semichemical pulp is washed in two stages

West Virginia modernizes and improves Covington mill operations

New buildings, new equipment, and new layout provide consolidation and integration of scattered facilities

▶▶▶ NEW INSTALLATIONS were placed in operation recently at the Covington, Va., plant of West Virginia Pulp and Paper Co. in another step designed to streamline two of the mill's principal operations.

This is phase two of a four-stage project which ultimately will transform the mill's previously scattered pulpwood handling and chipping operations and its pulp-making facilities, except bleaching, into two compact straight-line operations, balanced equally for pine and hardwood production. Ali these operations will be located on the east side of the Jackson River.

It is expected that this portion of the general modernization program will be complete in the spring of 1952. Says Crawley Williams, manager of the Covington plant: "All of these changes are directed toward increasing the efficiency of our operations and taking better advantage of the mixed wood supply available in this region. For the community and for the people who work in the mill they promise the long term economic security that goes only with a sound, efficient and competitive operation."

Operating changes required numerous personnel shifts. Temporary job assignments to form the work teams for operating the new equipment were worked out in detail in discussions between company officials and representatives of the union which represents employees of the Covington mill. Present changes will result in no reduction of the work force.

Installations scheduled for start-up early in May included a new hardwood yard, equipped to receive and handle by mechanical methods the great volume of hardwood sold to the mill by local farmers; a new consolidated chip house which replaces two such installations now operated, and two new units of the projected consolidated pulp mill, which eventually will combine the output of the No. 1 and No. 2 pulp mills presently operated. General contractor for this work is Rust Engineering Co. West Virginia's own engineering staff handled the basic engineering of the modernization program.

The new woodyard will place the mill's capacity for handling hardwood on a par with its pine handling facilities, which have been operating at the dry run woodyard since 1947. The new hardwood layout replaces a makeshift operation that had been set up temporarily until a new system could be worked out.

Wood handling

New facilities of the hardwood yard include a mile of new roadway, laid out in a double loop; a waterway or flume about a quarter of a mile long which will convey hardwood unloaded from trucks and storage piles to the barking drums; an additional barking drum; new facilities for log sorting, and a large new conveyor to carry pulpwood logs to the chippers.

Engineered to expedite the handling of large volumes of wood delivered by truck, since about 80 per cent of the mill's hardwoods arrive in this manner, the new layout will provide every facility for fast entry, unloading and departure. The company has encouraged its wood producers to rig their trucks with the gear necessary for mechanical unloading by crane, a time-saving method developed by the company which has been in operation here for almost a year.

Flume conveyor

The flume, built of steel plate and concrete, parallels the hardwood storage piles on the east side of the wood yard. Built at a slight pitch, the flume is fed by a pump capable of circulating about 14,000 gallons of water per minute. Water flows through the sluiceway, which is about four ft. deep and five ft. wide, at a speed of about four miles per hour. It is capable of conveying about 800 cords of wood to the barking drums in a 24-hour period. Bark and other foreign matter in the water is screened out ahead of the pump as the water is re-circulated. Bark collected by the Link-Belt screens is processed and burned as fuel for power boilers.

The new hardwood yard, combined with the up-to-date pine yard with its large wood bridge and sluice system, gives the Covington plant one of the most modern wood-handling systems of any paper mill in the country. All the equipment in both yards is operated electrically by master controls from a high tower which gives the operator a sweeping view of all operations. Plans have been laid for many progressive features, including the installation of banks of lights throughout the yard to facilitate night operations.

At the first stage of wood processing, the plant has added a fourth barking drum, which was placed in operation to balance facilities for cleaning pine and hardwood. The new drum, built by Manitowoc Engineering Works, and one of the three presently operated, will be devoted exclusively to hardwood production. The other two will be on the pine wood line. Each drum can peel and clean about 400 cords of wood per day. Another installation on the hardwood line at this point includes new sorting equipment where logs too large for the chippers can be removed and logs imperfectly peeled can be recycled to the barking drums.

An important piece of new equipment installed at this stage is a new rubber belt conveyor, 825 ft. long, which will move peeled hardwood logs from the barking drums to the chip house. It was built by Robbins Conveyors, Inc., using a Goodyear conveyor belt. This new equipment is a distinct departure from the pinewood conveyor line, a conventional drag chain type, installed only a few years ago.

The new conveyor, which parallels the older pine conveyor, is a continous belt of rubber, looped over a series of steel rollers and powered by a 40 hp. motor. The belt is 1700 ft. long, spliced in one place, three ft. wide, about a half-inch thick, and weighs about five tons. Lower maintenance costs, plus more efficient operation are advantages which engineers hope to gain from this type conveyor.

Chipping

A consolidated chip house will be set up, on the east side of the river, in the old No. 2 chip house, which has been completely remodeled. The remodeled building will house two giant 10-knife chippers, each capable of chewing up about 30 cords of wood per hour. The pine wood chipper, built by Carthage Machine Co., was installed in the chip house in August, 1950, replacing smaller

chippers which had been processing pine wood. Hardwood is chipped by a twin piece of equipment, previously located in No. 1 chip house and which has been moved across the river.

When the new chip house begins operations, chips from all the mill's pulping facilities will be provided from this central point. Until the pulp mill consolidation is completed, both pine and hardwood chips will be trucked from this chip house, across the river to No. 1 pulp mill.

The hardwood unit, like the chipper it is being placed alongside, will be served by screens designed to remove under- and over-size chips, and a new re-chipper, which reduces over-size chips, rejected by the screens, to uniform pulping size. Under-size chips and sawdust which the screens sift out are burned with bark as power boiler fuel.

The consolidated chip house is equipped with two cylindrical steel bins built on the ground level, an innovation at Covington where such installations in the past have always been located in buildings above the digesters. The new bins are equipped with intricate conveyor belt and elevator systems which will deliver chips to the digesters and semi-chemical cookers. About 700 ft. of conveyor belts and two elevators are included in the delivery system, which will be operated automatically from control panels in the pulp mill. The bins have sufficient capacity to give the mill a 15-hour supply of chips, which is about triple the storage space of the old system. Steel tank installations were made by Chattanooga Boiler Co.

Semichemical pulping

Eventually all the mill's chemical and semichemical pulping operations, with the exception of bleaching, will be centralized on the east side of the river, but the only new pulp mill installations scheduled to go into operation at this stage include a new semichemical pulping unit and a second line of new rotary vacuum washers. This equipment is located in a new steel-and-tile building, erected recently adjacent to No. 2 pulp mill. After the present No. 2 pulp mill has been completely remodeled and sufficient new equipment added, it, along with the new building, will be known as the consolidated pulp mill.

Hardwood semichemical pulp for nine-point corrugating medium is cooked in an M&D continuous digester (built by Medura Inc., Wausau, Wis.). This new type of continuous digester closely reproduces regular digester conditions because it employs the submerged cooking process. The new unit eventually will be operated alongside two older semichemical units, now located in No. 1 pulp mill, which will be moved to the consolidated pulp mill as the improvement program progresses.

The full capacity of the new semichemical cooker will be utilized to make pulp for nine-point corrugating board until the consolidation of these units is completed. Because of greater versatility provided by highly technical improvement incorporated in the new unit, it may be used at some future date to experiment with finer grades of semichemical pulp.

Hot brown stock refining

The new rotary vacuum washers going into operation at this time will serve the new semichemical layout. This is an Impco two-stage unit, equipped with cylinders, measuring 11½ ft. in diameter and 16 ft. in width. To improve the quality of the pulp, the plant has introduced a hot refining system in the new semichemical line, by which hot stock from the digester passes from the crushers, which separate the fibers, to two Sutherland refiners. The refiners will process the pulp before it enters the washing system, assuring a cleaner and more efficient wash than is obtainable in the normal process.

Brown stock washing

The two-stage unit eventually will clean all the pulp produced by the three semichemical units, replacing a small single stage washing unit now serving two semichemical cookers located in No. 1 pulp mill. The two washers for the semichemical pulp line have been installed alongside a large three-stage unit which has been washing pulp on the pine line since late in March. A third three-stage unit will be installed later for the hardwood line. The pine washers replace eight pan-type batch washers in No. 2 pulp mill and the third line will replace nine washers now located in No. 1 pulp mill.

Plant engineers expect the three lines of new washers to bring about improvement in the condition of the river since they will provide a closed system at this stage of the process, keeping out of the stream some of the weak wastes which have been discharged from the pulp mill in the past. Because the efficient new units require less water to wash the pulp clean, the rotary washers can remove waste liquor from the pulp at high concentration. All wash water too weak for processing in the recovery system is contained in the system and re-used until its liquor strength builds up to a point where the recovery evaporators can handle it. Because of the great volume of water required to wash pulp by the old batch system, highly dilute waste water, known as weak washings, which could not be handled by the recovery units, had been discharged into the river.

The new washers are models of operating ease, with push-button controls for every phase of the operation. Large console instrument panels are located alongside each unit, allowing the operator to control the entire job with his finger-tips. All the operating and production data of the three units will be automatically recorded on a large control panel. Instrumentation for this installation was supplied by Minneapolis-Honeywell Regulator Co.

Built over each line of washers is a hood which funnels steam and fumes into a ventilating system which discharges into the atmosphere. This system eliminates most of the heat and odors usually associated with the old batch operation, improving to a great degree the working conditions.

Camp's expansion program—continued from page 285

8-roll open side calender stack with motor-driven lift. Beloit heavy-duty automatic air operated reel for rolls up to 72 inches diam.; rope carrier takes sheet from dryer to reel. Beloit double-drum winder with both shear cut and score cut slitters; water-cooled, air operated brake on unwind stand; hydraulically operated roll lowering table.

Drive—Beloit mechanical drive with Westinghouse steam turbine drives the second press, dryer sections, breaker stack, calendars and reel. Fourdrinier, first press and winders are electrically driven.

Stock preparation

Five Sutherland refiners driven by Westinghouse synchronous motors; two refiners have 48-inch disks and three have 42-inch disks. One Jones Majestic tickler jordan. Twelve Vortraps for removing dirt.

New recovery furnace

Built by Babcock & Wilcox. Designed to handle the black liquor from 350 tons of pulp per day. Steam capacity—155,000 lb. per hr.; designed to operate at 650 psi and 750 F. Now operates at 450 psi. Murray cascade evaporator.

Power plant

Being partially converted from a 450 psi system to a 650 psi system. In 1945 a new B & W boiler was installed, burning either coal or oil, capacity 140,000 lb. per hr. of steam. New Westinghouse 7500 kw. turbogenerator has recently been installed. New 650 psi steam turbine has replaced the 450 psi turbine on an old 3500 kw. turbogenerator.

Low boiler pressure—low power economy

DAVID MOFFAT MYERS
Myers & Addington, New York

▶▶▶ THE MOST COMMON cause of high cost of power in paper mills is that in the original design the initial boiler pressure is too low. This I have found to be the case generally in the older mills and to a large extent in plants which were built even as recently as a dozen years ago.

Power plant out of balance

When the boiler pressure is too low, the power plant is out of balance, so that the full quota of by-product energy is not available. All the power cannot be made from the process steam, and a deficiency exists which must be made up either by purchasing or by generating the balance by means of condensing turbines.

For example, a paper mill requiring 100,000 lb. per hour of process steam at 40-lb. gauge pressure may have an electric demand of 5000 kw. with boilers designed to give 400-lb. pressure with proper superheat at the turbine throttle.

This plant will develop about 4000 kw. as by-product from the process steam by passing the boiler steam through a turbine-generator exhausting into the process steam main. This means a deficiency of 1000 kw. which must be made up. If this balance is generated by a condensing turbine, about 12 lb. of steam per kw-hr. will be required as against the equivalent of 2.76 lb. if made as by-product power.

Now if this plant had been installed for 730 lb. instead of 400 lb., the additional 1000 kw. would have been available without recourse to the relatively expensive power through condensing operation or the probably still more costly purchase of this block of energy.

If the mill's boilers were capable of only 200 lb. pressure, then the by-product power available would be only about 2700 kw., leaving a deficit of 2300 kw. This must be obtained at relatively great cost either by purchase or by condensing operation.

Now if all or a part of our 100,000 lb. per hour of process steam is required at a higher pressure than 40 lb., then the initial boiler pressure must be raised accordingly in order that all the needed power may be obtained as a by-product of the process steam.

In view of the foregoing, it is obvious that the determining factor in the selection of boiler pressure is the amount of process steam required per hour compared to the kw. demand. For a given process steam pressure or back pressure, this determines the initial pressure for a balanced plant, and as back pressure rises, so also must boiler pressure be raised.

The engineer's first calculation, therefore, is to divide the steam demand by the kw. demand to get this ratio of steam to power or pounds of steam per hour to kw.

Chart aids analysis

We have here computed and plotted steam rates per kw-hr. for a 5000 kw. turbine-generator in the chart for use when only a single process or back pressure is required.

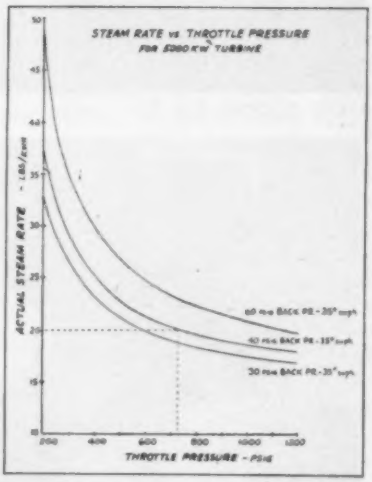
By reference to this chart with respect to the foregoing examples, it is seen that if the required ratio of steam to kw., or steam rate, is followed horizontally to intersect the curve of the back pressure, the point directly below on the ordinate indicates the necessary pressure at the turbine throttle.

In each case, sufficient total temperature has been assigned to the initial steam so that turbine exhaust will have a few degrees of superheat for reduction of distribution losses. Since the total throttle temperature is different for each back pressure, it is not shown in the chart.

Both the steam rates and exhaust temperature will vary with the capacity and loading of the turbine so that these effects are carefully estimated in the actual design of a specific installation.

Although the usual paper mill load closely approaches uniformity and thus lends itself to efficient generation of power, there will be swings from the average in both steam and power which will not always harmonize. Thus, if the power plant is perfectly balanced under average conditions, it often will be out of balance to a certain extent.

One way of meeting this situation would be to design for a higher throttle pressure than needed for the average loads, so that when more power were needed than the average ratio, it would be available without developing an excess of exhaust steam above that required for process.



At other periods when the load on the turbine did not give enough exhaust for the process, resort would be had to automatic make-up by passing steam from the boilers to process through a reducing and desuperheater station.

Such a design would result in maximum thermal efficiency. It is often true, however, from a dollar and cents standpoint that a moderate compromise may be more practical.

Such a device may ordinarily consist in balancing against a weighted average condition and taking up excessive swings of power demand by employing a modicum of condensing operation. The amount of steam reaching the condenser should be kept at the minimum necessary to balance swing demands of power.

How this is accomplished will be discussed in the next installment.

Allow for future load

The general principle to be emphasized thus far, with regard to paper mill power modernization, is that of adopting a sufficiently high throttle pressure to insure not only an efficiently balanced plant for expected loads, but also for future loads which are likely with the present trend to demand a still higher power to steam ratio.

FROM COOKER—Fork truck replaces manual transporting of cooked pulp

TO BEATER—Revolving head attachment permits fast and efficient dumping into beater

How Massachusetts mill solved a materials handling problem

▶▶▶ Better materials handling is helping Hollingsworth & Vose Co., West Groton, Mass., obtain more efficient production in its pulp beater department. Cooked pulp stock—used by the company in the manufacture of its rag, jute, kraft and sulphite technical and industrial papers—has to be transferred from rotary boilers to the beaters located from 200 to 400 feet away. The problem was to replace the manual handling methods with mechanized equipment which could be operated in congested areas.

The time-saving handling technique which has replaced the slower, more expensive manual trucking utilizes a 4000-pound capacity fork truck equipped with a hydraulically operated revolving head attachment. The revolving head rotates a full 360 degrees in either direction, the direction and speed of rotation being controlled by a lever-actuated metering valve. Mounted on the lift carriage and fitted with conventional forks for carrying and dumping the skid type boxes, it provides a fast means of unloading the pulp into beaters. This truck and attachment have cut handling time by 8 man-hours per shift or a total of 24 man-hours per day for the plant's three shift operation.

Prior to the installation of this truck, made by The Baker-Raulang Co., Cleveland, Ohio, two men were needed to push hand trucks of a smaller capacity. To unload these hand trucks it was necessary to shovel the material into the beaters. Because one of the beater rooms is on a higher floor level than the boiler room, the hand trucks had to be moved to this level by an elevator. A 12 per cent ramp connecting the two levels has been built so the fork truck can deliver the material to this room in the shortest possible time.

PAPER AND PAPERBOARD MAKING

Part 16 of Harry Williamson's book is omitted this month but will appear in *The* PAPER INDUSTRY for July.

Bark Beetle Damage Increasing in South

▶▶▶ IN AN AREA of only 200 square miles, bark beetles killed over 25 million board feet of valuable pine timber in east Texas in 1950, according to a recent report from the U. S. Department of Agriculture Bureau of Entomology and Plant Quarantine. Other outbreaks occurred in other southern areas, but on a more limited scale. These outbreaks appear to be continuing into 1951.

Three kinds of beetles are responsible for this destruction. The worst of the three is the southern pine beetle. It has caused most of the damage so far, but the black turpentine beetle and engraver beetles are also involved in the outbreaks. The black turpentine beetle has caused considerable damage over the past two or three years.

These beetles can be controlled without great difficulty. Infestations can be killed out by removing infested trees during fall and winter, when the beetle crop for the next year is under the bark of infested trees.

Large pitch masses at the base of pine trees indicate attack by the turpentine beetle. Such infested trees should be removed and salvaged before the tops are completely brown. Valuable shade or turpentine trees can be saved by spraying infested portions of the trunks with benzene hexachloride or chlordane. The treatment usually prevents future infestation until the tree recovers.

Trees infested with the southern pine beetle and engraver beetle should be removed. Dead trees having bark peppered with "shot holes" can be ignored because the holes indicate the beetles already have gone.

It is easier and cheaper to control these beetles in early stages of outbreaks. Wholesale killing of trees will follow unless steps are taken to control the pests prior to "outbreak" stages.

An effort is being made by Federal, State and public land-managing agencies to detect and record the presence of these destructive pests. This co-operative effort is possible because of the recently enacted Forest Pest Control Act, passed by the 80th Congress. Only by these efforts can outbreaks of serious pests be prevented, or controlled in time to save timber sources.

Centrifugal pumps . . .

Part 14 of a series . . .
Construction materials—I

IGOR J. KARASSIK and ROY CARTER
Application Engineers
Worthington Pump & Machinery Corporation

▶▶▶ The conditions of service and the nature of the liquid to be handled determine the most satisfactory materials to be used in the construction of centrifugal pumps. Some of the factors which enter into the selection of the most suitable materials are:

1—Abrasiveness of suspended solids
2—Corrosion resistance
3—Electrochemical action
4—Pumping temperature
5—Head per stage (as it affects both the impeller peripheral velocity and the liquid velocities in the waterways)
6—Operating pressure
7—Suitability of the material to the structural features of the particular pump involved
8—Load factor and expected duration of the pumping installation

It must be noted that centrifugal pumps can be manufactured of almost all the known common metals or metal alloys as well as of porcelain, glass and even synthetics. At the same time, it is not intended to present here a listing of all the liquids which may be encountered in centrifugal pump applications and a corresponding tabulation of the materials commonly recommended for each of these liquids. Such a listing can be readily found in the Standards published by the Hydraulic Institute, as well as in the catalogues and bulletins of pump manufacturers. A very detailed presentation of recommended materials can be obtained specifically from those manufacturers who specialize in centrifugal pumping equipment for various chemical services, for it is in this latter application that one can find the greatest variety of very special problems. Instead, this article will present a general picture of the considerations which need be given to a variety of factors in the evaluation of this or that material for use in this or that part of a centrifugal pump.

Material from this article will be included in a book on centrifugal pumps now being prepared by the authors; hence, all rights to republication are reserved by the authors.

Construction materials for pump components

Our first analysis will thus concern itself with the separate parts which comprise a centrifugal pump and with the materials most commonly used for each of these parts (See Table 1).

Pump casings—Centrifugal pump casings are usually made of cast iron. For some services, alloy irons may be desirable to provide a more refined crystalline structure. Bronze is frequently used for pump casings when the liquid pumped is mildly corrosive, as for instance, sea water. Cast steel or even forged steel is used when the discharge pressure or the pumping temperature or a combination of both makes cast iron unsuitable for the application, while stainless steel casings are used when the pumped liquid is corrosive or excessively abrasive. Porcelain or glass casings are sometime used for very special applications.

Impellers—Bronze impellers are generally preferred when handling average waters because bronze is easier to cast when complicated cored sections are involved, it is easier to machine, smoother surfaces can be obtained and, finally, because bronze does not rust. However, it is not desirable to use bronze impellers with cast iron casings if the liquid handled is a strong electrolyte. In such cases, regular or alloy cast iron, cast steel or even stainless steel may be used. The latter materials, while more costly than regular cast iron, have a great number of advantages which make them preferable.

Because of the higher coefficient of thermal expansion of bronze when compared to that of steel shafts, bronze impellers are seldom used when the liquid temperature exceeds 250 to 270 F. and preference is given to cast steel or stainless steel at higher temperatures.

Wearing rings—Wearing rings are usually made of bronze for the same reasons as the impellers. However, cast iron, cast steel, stainless steel or Monel rings are sometimes used, regardless of whether the impeller itself is made of bronze or of another metal. Such metals are used when hardness or other properties unobtainable with bronze are required.

Shafts—In pumps where shaft sleeves are used, shafts are generally made of open hearth steel. When high stresses are to be encountered, preference may be given to high tensile strength alloy steels. When corrosive liquids are handled, some seepage may occur either through the pores of the impeller hub or through the joint between the impeller and the sleeves thus requiring the use of a non-corrosive metal like stainless steel, phosphor bronze, or Monel metal. The shafts of pumps which are made without shaft sleeves are generally made of stainless steel, phosphor bronze, or Monel metal depending upon the liquid to be handled.

Shaft sleeves—In the majority, shaft sleeves are made of bronze. When bronze sleeves are not satisfactory because of their relative low degree of resistance to abrasion, stainless steel is used. While a few years ago steel sleeves were more prevalent than stainless steel, the growing popularity and reduced cost of the stainless alloys has caused stainless steel to supersede ordinary steel, and, in some services such as boiler feed, even bronze as shaft sleeve material.

A shaft sleeve which protects a shaft in a stuffing box must be made of a material that can be given a smooth finish so it will operate properly in con-

TABLE 1—Materials Commonly Used in Centrifugal Pumps

Part	Standard Fitted Pump	All Iron Pump	All Bronze Pump
Casing	Cast Iron	Cast Iron	Bronze
Suction Head	Cast Iron	Cast Iron	Bronze
Impeller	Bronze	Cast Iron	Bronze
Impeller Ring	Bronze	Cast Iron or Steel	Bronze
Casing Ring	Bronze	Cast Iron	Bronze
Diffuser	Cast Iron or Bronze	Cast Iron	Bronze
Stage Pilce	Cast Iron or Bronze	Cast Iron	Bronze
Shaft (if sleeve used)	Steel	Steel	Steel, Bronze or Monel
Shaft (if no sleeve used	Stainless Steel or Steel	Stainless Steel or Steel	Bronze or Monel
Shaft Sleeve	Bronze	Steel or Stainless Steel	Bronze
Gland	Bronze	Cast Iron	Bronze

NOTE: Materials for bearing housings, bearings and other parts are not generally affected by the liquid handled.

junction with the packing. Thus cast iron is rarely used for shaft sleeves.

Glands—Glands are generally made of bronze, although cast iron or steel may be used for all-iron fitted pumps. Where pumps are handling hydrocarbons, iron or steel glands are bushed with bronze to avoid possible sparking which might ignite inflammable vapors.

Pump fittings

The expression "pump fittings" is used rather loosely to mean two entirely separate things. In the most accepted sense, it refers to the general construction features of the pump, as for example "ball bearing fitted pump", or to the combination of materials used in the pump, as "all-iron fitted pump." In a different category (such as when applied in the expression "underwriter fittings"), it may refer to various pieces of auxiliary equipment, such as valves, gauges or even tools.

Standard fitted pump—The so-called "standard fitted" centrifugal pump as defined by the Hydraulic Institute is bronze fitted. It has a cast iron casing, steel shaft, bronze impeller and wearing rings and bronze shaft sleeves, when used. Some manufacturers regularly furnish stainless steel shafts on pumps without shaft sleeves as standard fitted pumps.

Various centrifugal pump manufacturers have developed specific material selections for pumps designed for special services. When a pump is so constructed it is generally termed as a "standard pump" although reference is sometimes erroneously made to "standard fitted pump," even though the materials used do not correspond to the Hydraulic Institute definition.

All bronze pump—When all parts of a centrifugal pump which come into contact with the liquid pumped are made of bronze, the pump is considered to be an "all bronze pump."

All iron pump—When all parts of a centrifugal pump which come into contact with the liquid pumped are made or iron or of ferrous metals, the pump is considered to be an "all iron pump."

Acid-resisting pump—An acid-resisting pump is such that all parts of the pump in direct contact with the liquid pumped are constructed of such materials as will offer the maximum resistance to the corrosive action of the liquid.

Salt water pumps

Centrifugal pumps handling salt or sea water may be built with standard fittings —that is, cast iron casings and bronze trim, in all-iron, in all-bronze or with iron casings and stainless steel fittings— depending on a number of factors.

Thousands of standard fitted pumps are in use handling sea water, but occasionally that type is not suitable, mostly when the sea water is contaminated as is the case with harbor waters. Failures are usually due to galvanic action between the bronze parts and the cast iron casing which graphitizes and is ultimately a total loss. Under high suction lift conditions, galvanic action is accelerated due to the release of oxygen from the water.

While an all iron pump avoids the electrolytic action between bronze parts and cast iron casings, such action may occur nevertheless. A certain amount of iron dissolution may take place, leaving graphitized areas. These areas perform as cathodes to the untouched anodic parts of cast iron and the resulting galvanic action is self-accelerated.

To avoid the graphitization and poor resistance to cavitation of cast iron impellers, these together with other small pump parts may be made of stainless steel.

In general, an all bronze pump should give the longest life for sea water conditions; instances are recorded of all bronze pumps lasting over 20 years handling sea or harbor water. Some harbor waters are contaminated by chemicals which make bronze unsuitable.

Limitations on cast iron for pump casings

Cast iron at normal temperatures has definite strength limitations and a cast iron casing of a given design will only be suitable for a definite pressure limit. If higher pressures are encountered (either through operation at higher than design speeds or through the existence of high suction pressures), the design must either be modified to obtain greater strength or a metal which can be stressed to a higher value, such as cast steel, must be substituted for the cast iron.

Occasionally, pumping systems are subjected to water hammer or shock pressures far in excess of the normal operating pressures and a stronger metal than cast iron is necessary.

While theoretically it is possible in some cases to use a cast iron casing under high pressure, the thickness of metal required would not be satisfactory from the point of view of foundry practice. In some cases, substitution of thinner cast steel sections for heavy cast iron casings may compensate the higher material cost, almost to the point where use of cast steel is the more economical solution.

Cast iron loses in tensile strength and becomes quite brittle at low temperatures. For this reason, in pumps handling liquids (such as brine) at very low temperatures the pump casings generally are made of alloyed cast iron or cast steel.

While each design of centrifugal pump has its own pressure and temperature limitations, there is an upper limit where practical and economic reasons dictate the use of cast steel regardless of pump design. Thus, cast iron casings are seldom used for presures over 1000 to 100 psi and temperatures over 350 F.

Limitations on bronze for pump fittings

Temperature limitations—Bronze expands approximately 40 per cent more than steel. Since pumps are assembled at normal room temperatures, the original radial clearance between the hub of a bronze impeller and a steel shaft will increase under operating conditions if the pumping temperature is above normal. This increased clearance can act to loosen the impeller on the shaft and introduces the possibility of leakage and erosion. In addition it must be remembered that the impeller assembly must be held axially by means of shaft nuts or shaft sleeves which themselves are fixed on the shaft by means of external nuts.

If the axial assembly is made tight under cold conditions, the unequal expansion of the impeller hub and of the shaft will cause "crushing" of the bronze impeller hub and may even set up severe stresses in the shaft itself. If the assembly is made so as to be tight under operating temperature conditions, the impeller will be loose at low temperatures and there is no possible provision to hold it in accurate axial alignment until the pump becomes heated.

Finally, if there are changes in the operating temperature, it would be impossible to keep the assembly tight at all temperatures without setting up excessive stresses.

These possibilities are removed when the pump fittings are such that the expansion of the shaft, impellers, and sleeves is equal. For these reasons, bronze is generally not used for pump fittings whenever the temperature of the pumped liquid exceeds 250 F.

Peripheral speed limitations—The centrifugal stress exerted on an impeller and the resulting stretch at the impeller hub may become quite appreciable at the higher peripheral speeds used in modern high head pumps. As an example, a typical 12-inch impeller mounted on a 3-inch shaft and operating at 3600 RPM will have a stretch of approximately .0011 inch for bronze or cast iron. If, in addition to this, the pump handles hot water—say at 250 F.—and the impeller is made of bronze, there will be an additional temperature expansion difference of .0014 inch resulting in a total looseness of .0025 inch between the shaft and the impeller, which would be excessive.

Thus, to avoid the cumulative effect of excessive thermal and centrifugal expansion, the empirical limit to the use of bronze impellers in pumps handling hot liquids is a peripheral speed of approximately 160 feet per second, of a head of 375 feet per stage.

PAPER SKETCHES

AT THE TIME of the Spanish conquest of Mexico, the Maguey paper, made by the natives of that country, varied in bulk from the thickness of pasteboard to the thinness of lightweight Chinese paper.

PIPES of paper-pulp were used on an organ constructed in the 1880's by an Italian monk. There were 1400 pipes in all.

America's first papermaker, Rittenhouse, was also an experienced carpenter. It is said that much of the construction work on the mill was done by him.

It takes more than two pounds of wood to print an average American metropolitan Sunday newspaper edition composed of 98 pages plus a gravure supplement of 144 pages. An average Danish or English newspaper... running to six pages... uses about only one and one-half ounces of wood.

The Paper Industry Association News

APPA Begins Program of Community Relations— Donald Rochester in Charge

A new program, effective May 15, has been instituted by the American Paper and Pulp Association. This program, known as the Community Relations Program, was authorized by the Executive Committee and Board of Governors at the Annual Meeting in February. This plan will have as its goal the surrounding of paper mill communities with information that will not only be informative but educational.

Donald M. Rochester

In charge of this new program will be Donald M. Rochester, who comes to APPA from five years as manager of the Industry Division of American Forest Products Industries, Inc., Washington, D. C. He begins his work with a wealth of experience and knowledge of the industry. He started his career as superintendent of schools in a small town in northern Michigan, his native state. He subsequently worked for the Department of Conservation as public relations and training officer and later held the same position with the U. S. Forest Service. Also, he successfully handled the Forest Industries Information Committee. During his association with the AFPI, he has been contacting the lumber and paper industries.

Mr. Rochester's duties will, necessarily, require that he visit many paper mill communities, and he will welcome information about those areas where a substantial program is presently in effect.

Miami Valley Superintendents Hear Klouman of Armco

Executives of the various papermaking firms in the Miami Valley were among the 130 persons who attended the April 19 dinner meeting of the Miami Valley Division of The American Pulp and Paper Mill Superintendents Association, held at the Manchester Hotel, Middletown, Ohio.

G. H. Klouman, official representative of Armco Steel Corp., Middletown, Ohio, in the Industrial Affiliates organization of the Superintendents, introduced Bennett Chapple, assistant to the president of Armco, as the speaker of the evening. Discussing "Sinews of Steel," Mr. Chapple linked the production of steel with the current fight for democracy. He commented that today there is a yearly capacity of 104,000,000 tons of steel, as compared to 81,000,000 tons only a few years ago; he estimated that this capacity will be 120,000,000 tons by the end of 1952.

Mr. Chapple concluded his remarks by discussing the steel situation in Great Britain as it now exists under a socialistic control, and remarked that there is danger that an attempt may be made to nationalize American steel mills.

Michigan Superintendents Hold Ladies Night Meeting

Ladies Night, the gala social event of the Michigan Division of The American Pulp and Paper Mill Superintendents Association, took place Saturday evening, May 12, at the Hotel Harris in Kalamazoo, Michigan.

A cocktail hour, sponsored by the suppliers of the paper industry, preceded dinner.

O. W. Callighan, chairman of the Division, presided at the dinner and welcomed the guests. Glen Sutton, and Ray Barton, first vice president and trustee of the National Association respectively, extended greetings at the dinner table. Allan Hyer, chairman of the Industrial Affiliates Committee, invited the members to attend the National Convention (June 24-28) at Portland, Oregon.

L. M. Halleck, vice president, Kalamazoo Tank and Silo Co., was toastmaster. His humorous and pointed remarks kept his audience in a state of appreciative chuckling. Presented by Mr. Halleck, the charming Mrs. L. H. Mimms entertained the enthusiastically applauding crowd of one-hundred and eighty guests with several popular songs.

The catching tunes of Charlie Schaffer's Orchestra kept the superintendents and their companions well agitated and busy until the wee morning hours.

Credit for the arrangements of the successful party is due to R. H. Peeters and C. E. Van Buren.

Sizing Discussed at Lake Erie TAPPI Meeting

Surface treatments were discussed at the April 20th meeting of the Lake Erie Section of TAPPI, for which 50 members met at the Hickory Grill in Cleveland.

Vance Vallandigham of Kelco Co., known for his work on surface applications, presented a paper entitled "Application and Effect of Surface Sizing." Discussing the two major types of sizing —film former and saturating—as applied on the size press and calender stack of the board machine, Mr. Vallandigham illustrated his talk with photomicrographs showing the effect on board surface of wet pressing and calendering followed by surface sizing at the calender stack.

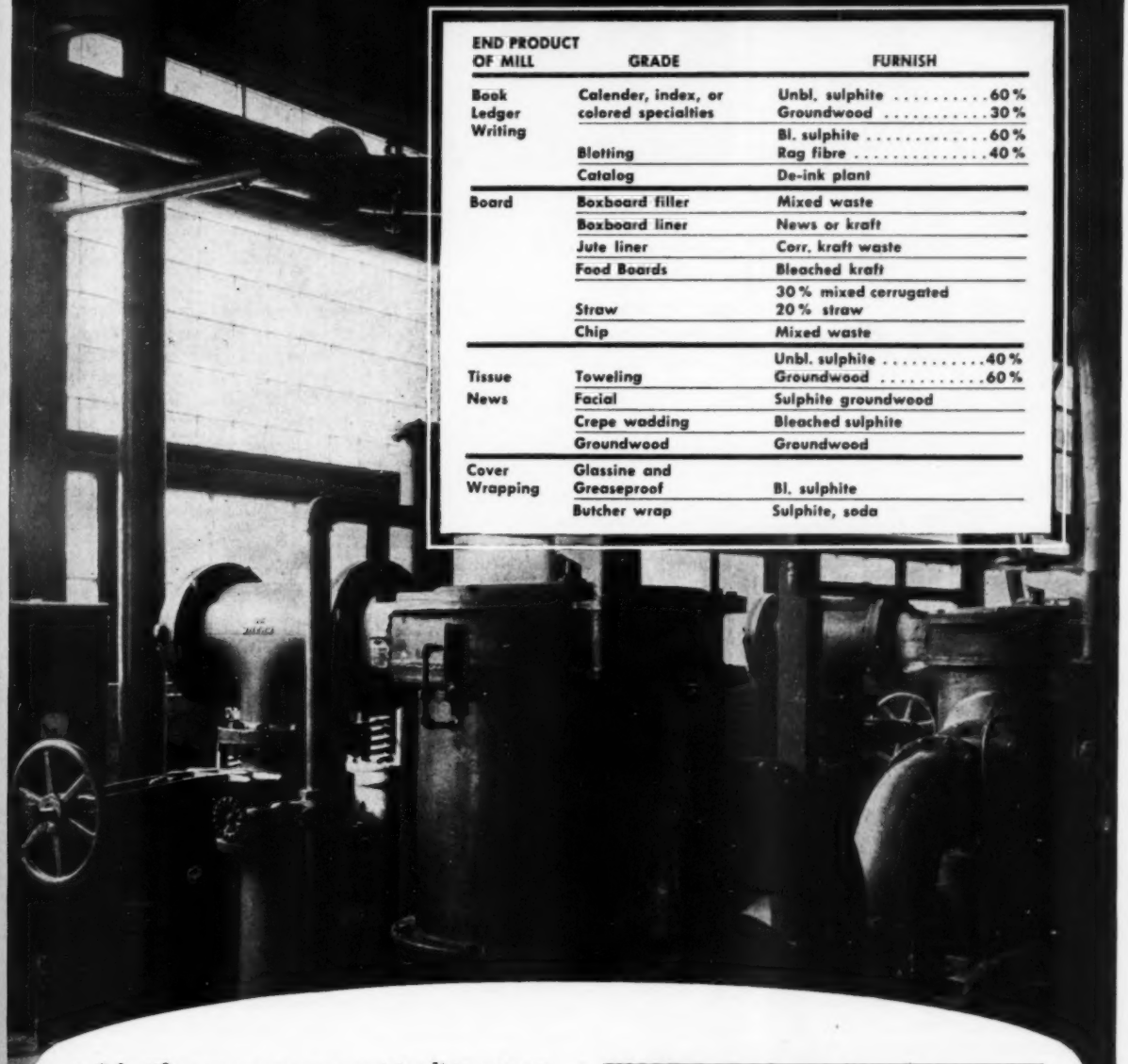
Mr. Vallandigham commented that good circulation across the calender box for even temperature of application and provision for prevention of foaming and low pickup contribute to uniform surface application. Stating that calendering squeezes heated air from the intercellular spaces into the calender solution to cause foam and to force the calender applicating away from the surface of the sheet, Mr. Vallandigham suggested that the solution to this problem is to run the calender solution as cool as possible —preferably at 120 F., so that contraction of the heated air takes place and creates a vacuum to draw in the calender solution.

In discussing "Protective and Decorative Coatings Applied from Organic Solvents," Paul Yoder of Pyroxylin Products, Inc., remarked that solvent-type coatings have experienced an extremely rapid growth; the first such coating was spirit varnish, followed by nigrocellulose, vinyl resins, vinyl acetate, copolymers of vinyl acetate and chloride. Still later came modified chlorinated and cyclicized rubber compounds, polyamides, alkyd, polystyrene and polyethylene resins.

After outlining equipment used in solvent applications, Mr. Yoder spoke of the properties of various resins, many of which are now in short supply due to the uncertainty of world conditions.

During the business meeting a revised constitution was submitted for the consideration of members, and a new slate of officers was presented by the nominating committee.

Selectifier screens replacing flats



END PRODUCT OF MILL	GRADE	FURNISH
Book Ledger Writing	Calender, index, or colored specialties	Unbl. sulphite ..... 60% Groundwood 30%
	Blotting	Bl. sulphite ..... 60% Rag fibre 40%
	Catalog	De-ink plant
Board	Boxboard filler	Mixed waste
	Boxboard liner	News or kraft
	Jute liner	Corr. kraft waste
	Food Boards	Bleached kraft
	Straw	30% mixed cerrugated 20% straw
	Chip	Mixed waste
Tissue News	Toweling	Unbl. sulphite ..... 40% Groundwood 60%
	Facial	Sulphite groundwood
	Crepe wadding	Bleached sulphite
	Groundwood	Groundwood
Cover Wrapping	Glassine and Greaseproof	Bl. sulphite
	Butcher wrap	Sulphite, soda

• Selectifier screens are an outstanding success as replacement for flat screens. No longer does a mill have to harbor their big sloppy "flats" when compact, clean equipment is available for the same work.

Also effective on filler as well as liner vats and ahead of head boxes in Fourdrinier mills.

There's a big future for the *Selectifier* screen as a replacement for flat screens so get the entire story—now.

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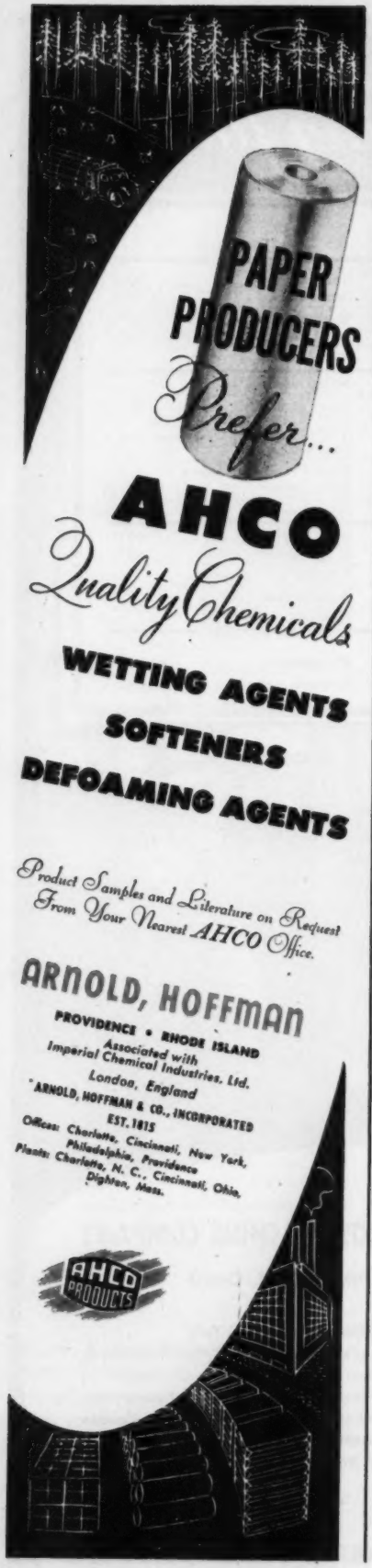
Subsidiary: B-C INTERNATIONAL LTD., Greener House
66/68 Haymarket, London, S. W. 1, England



NEW OFFICERS Ohio Section of TAPPI (L to R): Wm. Martin, corres. secretary; Arthur Thurn, exec. committee; R. D. McCarron, treasurer; Donald Goodman, past ch. exec. committee; H. A. Smith, chairman of Section; C. E. Brandon, vice chairman; Richard Morris, recording secretary; D. M. Yost, exec. committee.

Ohio TAPPI Elects Officers Enjoys Social Evening

A brief business meeting which was part of the annual gathering of the Ohio Section of TAPPI resulted in the election of the Section's officers for the 1951-52 period. H. A. Smith, vice chairman of the section for the past year and program chairman for the 1949-50 season, was elected chairman of the Section. Other officers include C. E. Brandon, vice chairman; William Martin, corresponding secretary; Richard Morris, recording secretary; R. D. McCarron, treasurer. The executive committee for the coming year includes Paul Clark, Donald Goodman, Arthur Thurn, P. S. Cade, and D. M. Yost.

Although Ken Geohegan, TAPPI national president, was unable to attend the meeting personally, presentation to him of a wrist watch was carried out, with G. H. Pringle, TAPPI vice president, accepting the gift for Mr. Geohegan. Presentation was made by the Ohio Section's retiring chairman, Donald Goodman.

A cocktail party sponsored by Shartle Brothers Machine Co. preceded the meeting, which was otherwise devoted not to academic questions but to a series of professional entertainment acts including dancers, jugglers, and singers. Cincinnati Rubber Co. furnished cigars for the enjoyment of those present.

APPA and N.H. Foresters Plan Joint Meeting this Fall

A joint annual meeting of The American Forestry Association and the Society for the Protection of New Hampshire Forests will be held October 8, 9, and 10 at Jefferson, N.J., according to an announcement received from D. C. Everest, AFA president, and Governor Sherman Adams of New Hampshire, chairman of the general committee.

Combining the state society's 50th anniversary observance and the AFA's 70th meeting, the convention will feature discussions on forestry and resources during morning sessions of the first and third days and an all-day field trip on October 9. Field trips are scheduled, as well, for the afternoons of October 8 and 10; the annual presentation of AFA conservation awards will be made at a banquet the evening of October 8.

Coming Events

June 24-29—Annual meeting of the Superintendents Association to be held at Multnomah Hotel, Portland, Ore.

July 24—Annual Field and Sport Day of the Michigan Division of the Superintendents Association, to be held at the Kalamazoo Country Club, Kalamazoo, Mich.

Sept. 10-14—The Sixth National Instrument Conference and Exhibit, sponsored by the Instrument Society of America, will be held at the Sam Houston Coliseum, Houston, Texas.

Sept. 14-15—Fall meeting of the Northwestern Division of the Superintendents Association to be held at the Northern Holiday Resort, Marenisco, Mich.

Sept. 16-19—Regional meeting of the American Institute of Chemical Engineers, to be held at French Lick, Ind.

Oct. 1-4—Sixth Annual Industrial Packaging and Materials Handling Exposition, sponsored by the Society of Industrial Packaging and Materials Handling Engineers, will be held at the Cleveland Public Auditorium, Cleveland, Ohio.

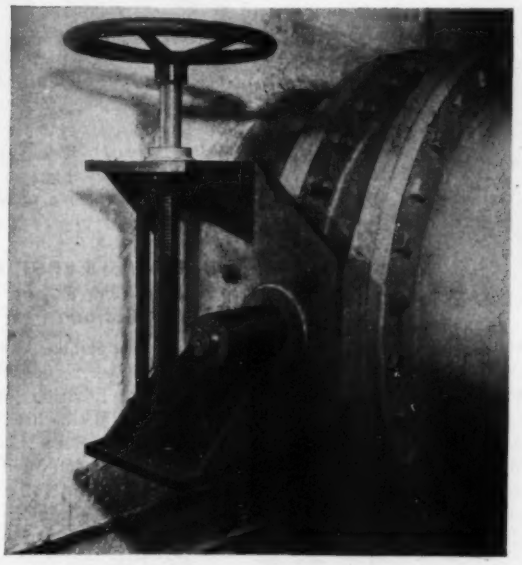
Oct. 8-10—Annual meeting of The American Forestry Association and the Society for the Protection of New Hampshire Forests, to be held at Jefferson, N.H.

Oct. 8-12—39th Annual Congress of the National Safety Council, Chicago, Ill. Headquarters will be in the Stevens Hotel; other schedules and program details to be announced later.

Oct. 10-12—A joint meeting of the Southern and Southeastern Divisions of the Superintendents Association at the George Washington Hotel, Jacksonville, Fla.

R-S valvEvents

• EXCERPTS FROM THE R-S BOOK OF EXPERIENCE •



RUGGED Simplicity

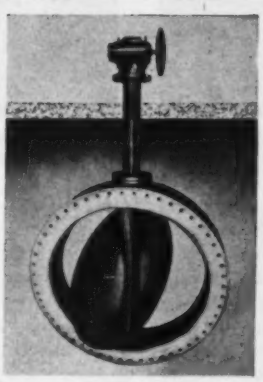
Correctly engineered mechanically and metallurgically, all body assemblies of R-S Valves equal or exceed A. S. A. standards in every detail. These valves are designed and constructed for rugged service and provided with such safety factors that they will exceed service expectations as well as reduce pumping and blower costs.

Consider also the few working parts, greater control rangeability, the self-cleaning feature and the fact that R-S Valves are readily adapted to automatic operation. Know the rugged simplicity of R-S Valves, and get the most from your valve investment.

District offices are listed in telephone directories as, "R-S Products Corp'n Valves".

R-S PRODUCTS CORPORATION
4600 Germantown Avenue, Philadelphia 44, Pa.
An S. Morgan Smith Company Subsidiary

No. 782—Heavy Duty Rubber Seated Wafer Type Valve with 5° angle seated vane and enclosed gear reduction drive. Gland can be removed and stuffing box repacked without removing prime mover.



No. 739-740—Sixty-inch, 50-pound Heavy Duty Valve with gear reduction drive and handwheel for handling water at 40 psig. Vertical valve stem enclosed in steel pipe support. Thrust bearing absorbs vertical load.

No. 730—R-S Heavy Duty Floor Stand for rugged service in connection with any standard R-S handwheel operated valve.

No. 767—A 3-Way Valve (Two 24-inch 125-pound Cast Iron Valves bolted to 125-pound American Standard Tee). Electric motor operated by cross linkage. Automatic declutching handwheel for emergency operation.

The Paper Industry Names in the News

J. O. Mason, who retires from Mead Corp.

Mead Corp.'s newly-appointed (L to R) exec. vice president, H. E. Whitaker; vice presidents H. A. Kidd and H. T. Mead

Mead Corp Elects New Vice Presidents

A board election held recently at The Mead Corp., Chillicothe, Ohio, resulted in the election of H. E. Whitaker, operating vice president for the past three years, as executive vice president. Mr. Whitaker replaces J. O. Mason, who will remain with the firm in a consulting capacity although he is retiring from the vice presidency.

Two new vice presidents, H. T. Mead, and H. A. Kidd, were also chosen. Mr. Mead has been assistant to the chairman of the board since 1945; Mr. Kidd is also vice president and general manager of Macon Kraft Co., a Mead Corporation subsidiary. Archibald D. Fraser was named assistant treasurer.

At the corporation's annual meeting, held immediately before the board meeting all board members but H. Gates Lloyd of Philadelphia were re-elected. Mr. Gates is now serving the United States Government. His place on the board was filled with the election of Robert H. Lee, a partner of Drexel & Co., Philadelphia; simultaneously, H. E. Whitaker was made a board member.

Minneapolis-Honeywell Defense Program Causes Several Personnel Changes

An intensified program to meet increasing defense requirements has been instituted by the Philadelphia industrial division of Minneapolis-Honeywell Regulator Co., Minneapolis.

The program includes co-ordinating and expediting of engineering, production, and delivery of highly sensitive industrial instruments, and has necessitated several personnel appointments.

Marshall B. Taft, assistant to Henry F. Dever, company president, has been named manager of staff operations in addition to his other duties. James N. Redpath has been made a special assistant to Mr. Dever, to serve as liason man between government and company activities. The firm's industry manager, Henry M. Schmitt, will henceforth devote his entire time to directing and coordinating sales in connection with the expanded AEC program.

W. W. Holland

E. Norval Hunter

W. W. Holland Goes to Oxford Paper as Mgr. of Production

The appointment of Walter W. Holland to the newly created post of manager of production at its Rumford (Maine) mill has just been announced by the Oxford Paper Co., through its assistant vice president and Rumford mill manager, T. F. Spear.

Mr. Holland has been associated with the paper industry in Canada for many years. Most recently, he has been general superintendent of the Quebec North Shore Paper Co., Baie Comeau, Quebec, having been associated with the company since 1941. Earlier experience included plant superintendent of the Pulp and Paper Research Institute of Canada in Montreal, and, subsequently, various production capacities with Price Brothers & Co. and the Ontario Paper Co.

Mr. Holland is now chairman of the Executive Council of the Canadian Technical Section of Pulp and Paper Association. He has been active in the Technical Section for a number of years.

Burton Ford of St. Regis Heads NPA Paper Shipping Sack Section

Newly-appointed chief of the Paper Shipping Sack Section of Containers and Packaging Division of the NPA is Burton A. Ford, vice president of St. Regis Paper Sales Corp., New York City. This Section will help carry out the NPA policy of suplying defense needs and maintaining essential civilian production.

Mr. Ford has had broad experience in paper shipping bag procedure. During World War II, he was a consultant on paper shipping sack specifications for the WBP from 1943 to 1945.

E. Norval Hunter Made a V. P. of KVP—in Charge of Canadian Operations

At a recent meeting of the board of directors of Kalamazoo Vegetable Parchment Co., Parchment, Mich., E. Norval Hunter was chosen a vice president of the firm and was simultaneously placed in charge of all KVP Canadian operations. Canadian operations include The KVP Co. Ltd., Espanola, Ont., of which Mr. Hunter is a director, vice president and secretary; and Appleford Paper Products Ltd., with plants at Hamilton, Ont., and Montreal, Que.

Mr. Hunter first joined KVP in 1944 as assistant to the late R. A. Hayward, then president of the firm. First in charge of the new sulphate mill built by KVP as an enlargement of the old groundwood mill of Abitibi Power and Paper Co. at Espanola, Mr. Hunter later became manager of manufacturing for the firm's pulp and paper operations.

Before joining KVP Mr. Hunter was sulphite superintendent for Great Lakes Paper Co., Ft. William, Ont. Earlier, he had spent six years with Abitibi at the Pine Falls and Port Arthur plants, where he had worked on papermachines, in the sulphite mill, and in the laboratory.

Mr. Hunter, a 1926 graduate of the

University of Manitoba, was chosen for his new appointment by Ben Avery, now president of The KVP Co. Ltd., who was at one time woods manager for Great Lakes Paper Co.

H. D. Martindale

C. R. Crawford

Highest Black-Clawson Posts Go to Martindale & Crawford

The president of The Black-Clawson Co., Hamilton, Ohio, Homer D. Martindale, was elected chairman of the company's board in a recent election; Mr. Martindale's successor as president is C. R. Crawford, former vice president and general manager of the Shartle Brothers Machine Co. division of Black-Clawson.

Mr. Martindale has been actively engaged in the management of Shartle Brothers—and later of Black-Clawson—for over fifty years. He became vice president of Black-Clawson in 1926 when Shartle, his earliest affiliation, was purchased by B-C; at that time he also became general manager of the Shartle Brothers Division. He succeeded the late H. L. Kutter as Black-Clawson president in 1946.

Mr. Crawford joined Shartle 42 years ago, working up through the ranks to become chief engineer in 1918. He held that position until he was appointed a Black-Clawson vice president in 1939. He was made general manager of the Shartle Division in 1946.

Pennsalt Executive Promotions

Several executive appointments have resulted from the current expansion program of Pennsylvania Salt Manufacturing Co., Philadelphia. G. A. Nelson, formerly superintendent of the firm's Wyandotte, Mich., plant, has been named works manager of that plant. Initially, Mr. Nelson will combine his earlier duties with those now assigned him.

New works manager of the company's southern plants is James M. McWhirter, formerly superintendent at Calvert City, Ky.; the southern plants include Calvert City, Montgomery, Ala., and Bryan, Texas.

Ritner W. Tomlinson, formerly superintendent of Pennsalt's Cornwells Heights, Pa., works, has been named superintendent of the Calvert City operations; Herman J. Eichenhofer, formerly assistant superintendent for processes at Wyandotte, has been chosen to succeed Mr. Tomlinson at Cornwell Heights. Mr. Eichenhofer will temporarily work with the firm's Central Engineering Department in Philadelphia on the development of new processes.

The former production supervisor at Wyandotte, Francis E. Murphy, has been appointed assistant superintendent of processes to succeed Mr. Eichenhofer.

Joseph T. Gormally, previously with the Philadelphia office, has been named assistant superintendent at Cornwells Heights, where he will serve as acting superintendent until Mr. Eichenofer assumes full time duties there.

English Visitor Studies Mfg. Methods at Black-Clawson

A recent visitor to the Black-Clawson Co., Hamilton, Ohio, was A. E. Smith, production supervisor of W. A. Baker and Co., Newport, Monmouthshire, England.

Mr. Smith's firm is the exclusive manufacturer of Black-Clawson-Shartle-Dilts equipment through B-C's subsidiary in England, B-C International Ltd. He visited the United States to study manufacturing methods and practices at the Shartle and Dilts divisions as they concern the complete line of stock preparatory equipment now being sold in England and Continental Europe by B-C International Ltd.

Southern Alkali Elects

Board chairman of Pittsburgh Plate Glass Co., Pittsburgh, since 1931, and a member of the board of Southern Alkali Corp, a wholly-owned Pittsburgh Glass subsidiary, since the alkali company was incorporated, Clarence M. Brown has been named to the newly-created post of chairman of Southern's board of directors.

E. T. Asplundh has been named president of Southern; associated with Pittsburgh Glass chemical operations since 1919, Mr. Asplundh has served as vice president in charge of Pittsburgh's Columbia Chemical Division since 1940 and as vice president of Southern Alkali since 1944.

New directors and officers of Southern are Leland Hazard, vice president and general counsel; and W. I. Galliher, vice president. Richard B. Tucker and E. D. Griffin will now serve as directors, in addition to Harry B. Higgins, Harold F. Pitcairn, Raymond Pitcairn, and Dwight Means, whose directorships continue. Mr. Higgins will serve as chairman of the executive committee and Mr. Means as a vice president.

Bird & Son Elects Dickinson and Hunsaker as Directors

Stockholders of Bird and Son, Inc., East Walpole, Mass., recently elected two new members—Elwood T. Dickinson and Jerome C. Hunsaker, Jr.—to the firm's board of directors, which now totals seventeen.

Mr. Dickinson, already serving several other firms as a director, is an officer of the management firm of Louis J. Hunter; the Hunter firm has been associated with Bird and Son for some time in a management capacity.

Mr. Hunsaker is a full partner of Colonial Management Associates, Boston, and holds vice presidencies and directorships in several other firms.

A. E. Smith

Dr. E. I. Stearns

Dr. Stearns Appointed Res. Assistant by American Cyanamid

The former sectional director of application research for American Cyanamid Co., Bound Brook, N.J., Dr. E. I. Stearns, has been named assistant to Dr. R. H. Kienle, director of the application research department.

Publisher of 50 papers and patent, Dr. Stearns' specialization has been in the phase rule, ultraviolet and visual spectrophotometry, photochemistry, instrumentation, optical properties of pigments, dye application and ornithology. Associated with American Cyanamid's Chemical Division since 1933, Dr. Stearns was appointed chief physicist in 1944, assistant director of physics research in 1945, and sectional director in 1948.

In his new capacity Dr. Stearns will conduct special research, technical evaluation and field service assignments.

J. R. Faegre was re-elected president of Minnesota and Ontario Paper Co., Minneapolis, at the company's annual meeting in April. At the same election, all other officials, including *C. T. McMurray*, executive vice president; *Clarence Larson*, vice president in charge

of production; *R. D. Main,* treasurer; *H. A. Hull,* secretary; *E. A. Johnston,* comptroller; and *C. O. Holmer,* assistant treasurer, were re-elected. Although the resignation of *R. H. M. Robinson* (See Necrology) as chairman of the board was accepted, no successor was named.

A. F. Reinking, formerly assistant sales manager of Worthington Pump and Machinery Corp., Harrison, N.J., has been named manager of the Steam Turbine Sales Division of the firm. He will make his headquarters at Worthington's Wellsville plant.

Elections at Signode Steel

A recent board meeting of Signode Steel Strapping Co., Chicago, resulted in the election of J. M. Moon, sales director, as vice president of the firm. Mr. Moon, associated with Signode since 1934, became general sales manager in 1947 and sales director, a post he will fill, in 1949. He will continue as sales director.

At the same election Robert Peterson was elected assistant treasurer of Signode.

John M. Todd now with Lesavoy Industries— Subs for I. L. Lesavoy

A temporary leave of absence because of illness has been granted O. J. Wilson, secretary of Lesavoy Industries, Inc., New York; his place as secretary and on the board of directors has been filled with the appointment of John M. Todd.

Mr. Todd, associated with Crown Zellerbach Corp. for 13 years, has held various sales and executive posts, including that of division manager; more recently, he has been active in public relations work for several industry firms including St. Regis Paper Co., New York, and Eastern Corp., Bangor, Me.

Author of extensive research papers concerning paper industry problems, Mr. Todd has also done work as an advertising account executive.

George W. Huggett has been appointed chairman of Canadian Industries, Ltd., Montreal, Canada; concurrently, *H. Greville Smith* was made president and chairman of the executive committee.

Robert A. Hitt, foreman at the Linden mill of the American Writing Paper Corp. in Holyoke, Mass., where he had been employed for 50 years, passed away recently at the age of 70.

A. F. Reinking

Warren A. Lacke

J. M. Moon

N. Jerry Jeran

John M. Todd

Warren O. Erickson

Warren Erickson Goes to Libbey-Owens-Ford Co. Plaskon Division

So that he may participate in research on industrial resins, Warren O. Erickson has joined the technical department of the Plaskon Division of Libbey-Owens-Ford Co., Toledo, Ohio. He will be most concerned with polyester resins.

A chemistry graduate of the University of Wisconsin, Mr. Erickson terminated work as a research and technical supervisor for the Northern Regional Laboratory of the U.S. Department of Agriculture, Peoria, Ill., to go to the Plaskon Division.

Previous to his Northern Regional work Mr. Erickson was associated with the field research division of Sacony-Vacuum Corp., Dallas, Texas, and with the paint division of Pittsburgh Plate Glass Co. in Milwaukee; while with Pittsburgh Glass he conducted experiments with polyesters and solvent extraction of vegetable oils.

Warren Lacke Succeeds Niderhauser, Who Retires From Continental Can

Upon the retirement of J. E. Niderhauser, formerly vice president in charge of industrial relations at Continental Can Co., New York, Warren A. Lacke was appointed general manager of industrial relations.

Previously assistant manager of industrial relations, Mr. Lacke has been associated with Continental Can since 1944; before joining the can company he was with the industrial relations department of Carnegie-Illinois Steel Co.

Mr. Niderhauser joined the firm in 1945, and was named a vice president in 1948.

N. Jerry Jeran now Treasurer of Lesavoy

Newly-appointed treasurer of Lesavoy Industries, Inc., New York, is N. Jerry Jeran, formerly associated with Sears, Roebuck & Co.

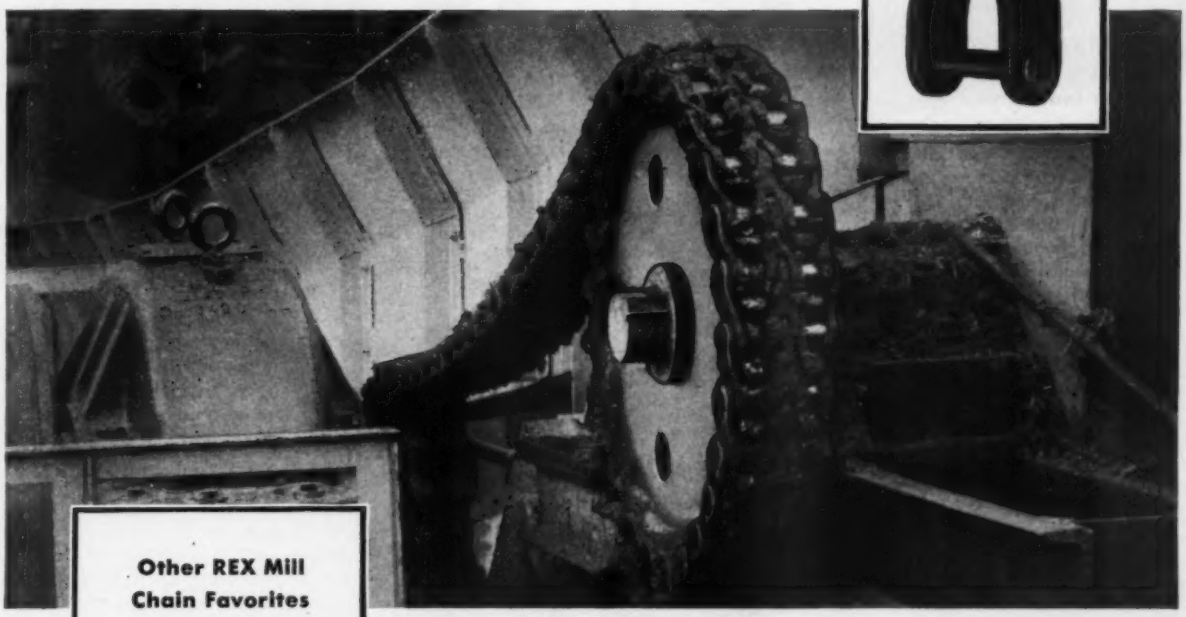
Of his 22-year association with Sears, Mr. Jeran spent the past three years in charge of all openings of Sears stores in Mexico, Brazil, and Venezuela. He made extensive buying contracts for the firm last summer in Japan.

Donald E. Springer has been appointed assistant chief engineer of Hooker Electrochemical Co., Niagara Falls, N.Y. Affiliated with Hooker since his 1936 graduation from Iowa State College, Mr. Springer has been employed in various departments as operator, shift foreman, supervisor, and draftsman; he has been with the firm's engineering department since 1941, and most recently has been assigned to special Hooker projects such as the design of the Hooker-Detrex plant at Ashtabula, Ohio, which was put into operation last June.

Harmon E. Keyes, chemical and metallurgical engineer, formerly of Phoenix, Arizona, has joined the technical staff of Infilco, Inc. (now located in Tucson, Arizona), as a special consultant. Mr. Keyes will deyote himself primarily to the further development of the autoxidation process, a field in which he holds many patents.

J. F. Roberts has been appointed director of engineering in the general machinery division of Allis-Chalmers, Milwaukee, Wis.; *R. C. Allen* has been made consulting engineer. Both men have had broad experience with utilities and large corporations. Each has served a number of years with Allis-Chalmers.

GET MORE HORSEPOWER PER CHAIN DOLLAR



Other REX Mill Chain Favorites

Rex H-Type Conveyor Chain

Rex Combination and Durobar Chain

Rex Refuse and Log Haul Chain

Baldwin-Rex Roller Chain

Rex Chabelco Steel Chain is ideal for mill drive service. Since most mill drives operate under heavy loads at low to moderate speeds, Rex Chabelco delivers more horsepower for each dollar of investment. Here's why:

First, for equivalent load, Rex Chabelco Chains and Sprockets are lower in original cost than other types of driving medium. Often a single strand Chabelco Chain will handle loads that require multiple strands in other types of drives.

Second, Rex Chabelco is lowest in overall operating cost and assures the longest overall drive life. It is a precision-built chain made of high carbon or alloy steel, heat treated for high strength and durability. Clearances are built in between chain parts, permitting exposed operation under severe conditions. Dust and dirt are far less likely to build up between chain parts and cause "freeze-ups." Heavy shock loads are easily accommodated. Maintenance is simpler . . . more economical.

Rex Chabelco Chains come in a wide variety of sizes and strengths. They are frequently used to replace cast chains of equivalent size where greater strength is necessary. They can often operate over the same sprockets as equivalent size cast chain.

Rex Chabelco Chain Drives are *easy* to select. For information, ask your local Rex Field Sales Engineer, or write to Chain Belt Company, 1714 W. Bruce Street, Milwaukee 4, Wis.

CHAIN BELT REX COMPANY ®

CHAINS AND SPROCKETS

Hector P. Boncher, V.P. of Dresser

Dresser Directorate (L to R): Prescott S. Bush; Henry P. Isham; Wm. A. McAfee; H. N. Mallon, president; and Norman Chandler

Hector Boncher Elected a Vice President of Dresser Industries

The election of Hector P. Boncher, general manager, Dresser Mfg. Division, one of the ten operating companies of Dresser Industries, Inc., Dallas, Texas, as a vice president of Dresser Industries, Inc., was announced recently.

Mr. Boncher was appointed assistant sales manager of Dresser Manufacturing in 1930, sales manager in 1938, and general manager in 1942.

Other officers of the company were re-elected. Prior to the Board Meeting at which time the elections were announced, four nationally prominent industrialists, who are directors of Dresser, were guests of honor at a luncheon given by H. N. Mallon, president of a group of prominent Dallas business men. This was the first directors meeting held at the Dallas headquarters of Dresser Industries, Inc., since removal of its headquarters from Cleveland, Ohio.

Leppla Will Be Technical Director for Division of Great Lakes Carbon

Former associate director of research at the Morton Grove, Ill., research laboratory of Great Lakes Carbon Corp., Los Angeles, Paul W. Leppla, has been appointed technical director of the firm's Dicalite Division with headquarters in Los Angeles.

Before joining Great Lakes Carbon four years ago Dr. Leppla, who earned his Ph.D. at the University of Illinois, was associated with Cardex Corp. as manager of chemical plants. His new responsibilities will include development of new and improved diatomaceous silica and related products.

Dennis J. Begley Entertained By Whiting Paper Officials Upon His Retirement

Retiring from service as a beater engineer with Whiting Paper Co., West Springfield, Mass., after 28 years, Dennis J. Begley was recently entertained by Whiting officials and fellow workers at the firm's No. 1 mill in Holyoke, Mass.

C. Lawrence Reece, chief chemist, presented 75-year-old Mr. Begley with a purse and pipe. Tributes to Mr. Begley were spoken by James T. Fitzgerald, general superintendent, and Albert Crosby, sales manager.

L. B. McKnight Given Newly Created Position at Chain Belt Co.

Elected to the newly-created position of executive vice president of Chain Belt Co., Milwaukee, is L. B. McKnight.

Mr. McKnight has served in various managerial capacities since joining Chain Belt in 1927; he has been a vice president and director since 1948.

Leo J. Haller

R. E. Greenfield

Leo J. Haller Joins Builders Foundry Sales Engineer Staff

The appointment of Leo J. Haller as a sales engineer in the Pittsburgh branch office of Builders Iron Foundry and its associates, Builders-Providence, Inc., Omega Machine Co. and %Proportioneers, Inc.%, has been announced.

Mr. Haller, a graduate of the University of Pittsburgh, resigned his position as a practice engineer with the Jones & Laughlin Steel Co., Pittsburgh, to join Builders Iron. Previous to his connection with Jones & Laughlin Mr. Haller worked as a sales engineer with Superior Valve and Fitting Co., also of Pittsburgh.

David R. Arnold, former internal auditor on the controller's staff and chief of management planning for The Gardner Board and Carton Co., Middletown, Ohio, has been appointed to the newly-created position of director of Gardner's management planning.

Richard C. Gearhart, formerly associated with the Michigan Department of Conservation, has been appointed manager of the Western regional office of American Forest Products Industries, Inc., Washington. Mr. Gearhart will make his headquarters at Portland, Ore.

Hyster Co. Makes Personnel Changes in Indus. Truck & Equipment Division

Three changes have been made in the Eastern division of industrial truck and tractor equipment personnel at Hyster Co., Portland, Ore.

J. W. Morgan, assistant sales manager of the Eastern tractor equipment division at Peoria, Ill., has been transferred to the industrial truck sales division, where he will be manager of the North Central district with headquarters at Buffalo, N.Y.

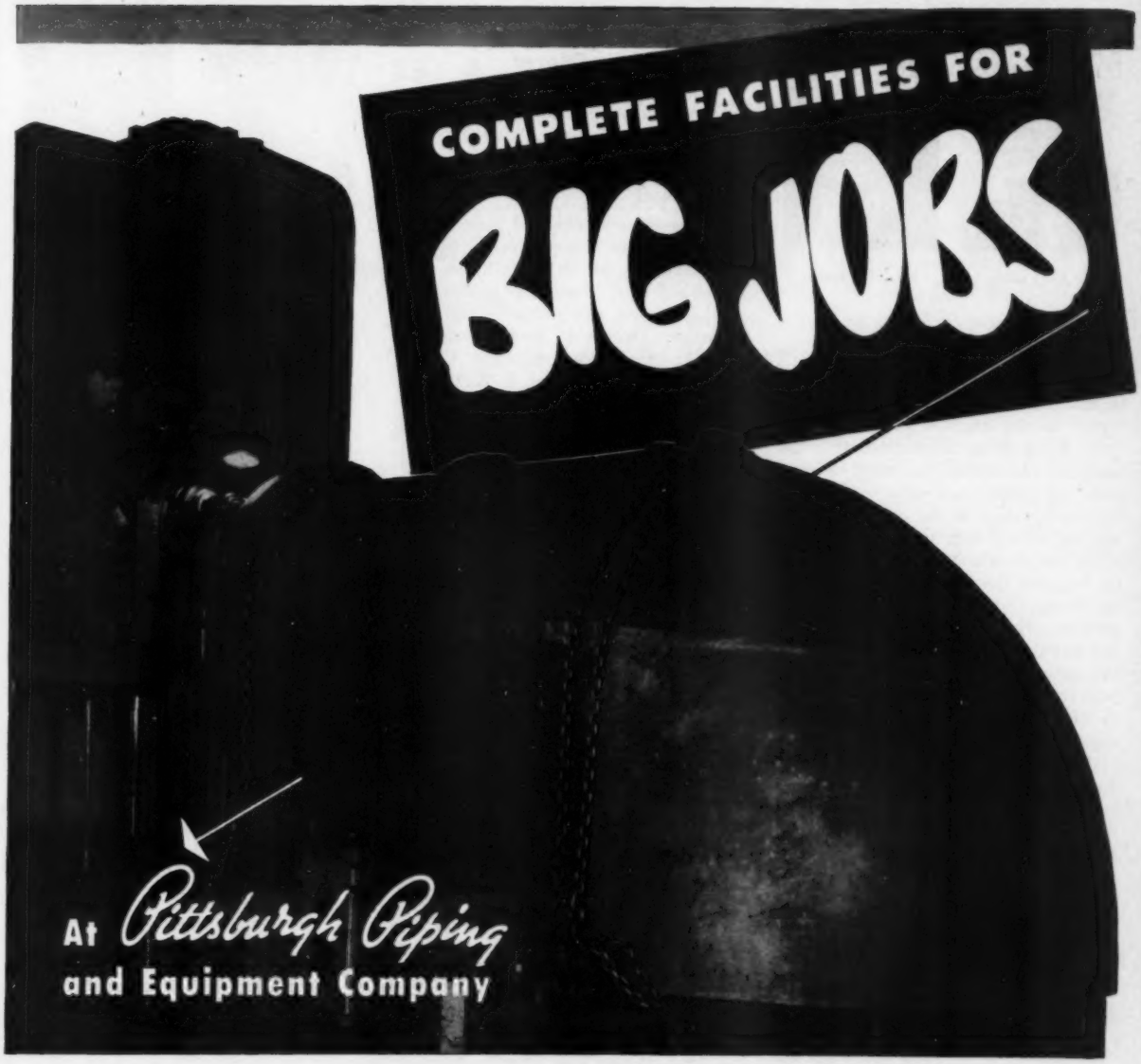
The former North Central district manager, Donald R. Shaffer, succeeds John E. Mitchell as Northeast district manager. Mr. Mitchell, a district manager for two years and formerly in the Hyster Chicago store, has joined Field Machine Co., Hyster dealer in Boston, Mass.

Dr. Greenfield Promoted to V.P. of Mfg. for Staley

General superintendent of A. E. Staley Manufacturing Co., Decatur, Ill., since 1946, Dr. R. E. Greenfield was recently elected vice president in charge of manufacturing for the company.

Associated with Staley since 1926, Dr. Greenfield has been a member of the board since 1947. The greater part of a $20,000,000 plant modernization program completed recently was carried out under his direct supervision.

Hugh M. Niven has been appointed general manager and director of Canadian Nashua Paper Co., Peterborough, Ont., Canada. Concurrently, *Vasco E. Nunez* was appointed chairman, *Robert A. Brown* was named president, *Russel Cole* was appointed plant manager and director, *John R. Marshall* was made secretary-treasurer, and *George T. Cheatle* was named assistant secretary-treasurer.



Machining a casting of this size requires special equipment—big equipment for handling big jobs.

Actually, this casting is small compared to the complex piping systems that are planned, prefabricated, and tested *under one roof* at Pittsburgh Piping and Equipment Company.

At P.P.&E. all facilities are integrated . . . engineering, metallurgical and mechanical laboratories, bending, Van Stoning, machining, heat-treating, stress-relieving, testing.

Because our manufacturing personnel and equipment are all under the roof of one great plant—our complete know-how, experience, and facilities are constantly available on every job.

This is another reason why you can depend upon Pittsburgh Piping and Equipment Company for service that provides greatest safety, highest efficiency, and longest life from high temperature, high pressure piping.

Pittsburgh Piping
AND EQUIPMENT COMPANY
10 Forty-Third Street — Pittsburgh, Penna.

O. John Mills

Fred C. Boyce

Sandy Hill Promotions

Important promotions recently were announced by The Sandy Hill Iron & Brass Works, Hudson Falls, N. Y.

O. John Mills, associated with the company since 1926, has been elevated from the position of sales manager to that of assistant to the president. During his service with the company, Mr. Mills has traveled widely, having been on business missions in most countries in Europe and in North and South America. He recently returned from a trip to Paramonga, Peru; this trip was in the interest of Sandy Hill's connection with the W. R. Grace Co. and its study of the Grace process for converting sugar cane bagasse to paper.

Nils Klykken, who has been with the Sandy Hill sales force since 1947, has been named to the position of manager of the Pulp Machinery Division. Mr. Klykken, who came to the company direct from the Kamyr organization in Sweden, is a recognized expert in the field of pulp bleaching, having had 12 years of experience with the Kamyr organization. Sandy Hill company holds the U.S. manufacturing rights for the Kamyr bleaching equipment.

Other organizational changes announced by Sandy Hill are: Foster P. Doane, Jr., plant manager, has been named an assistant vice president; John W. Crocker, becomes chief engineer; W. O. Hisey (Cf. P.I. May, 1951, p. 195) has been named a vice president; Loren G. Gallup, supervisor of planning, has been named assistant vice president; and George E. Clink becomes sales manager and associate chief engineer.

Dr. A. L. Elder, director of research for Corn Products Refining Co., Argo, Ill., has been elected president of the Associated Food and Container Institute, Chicago. Also elected were *H. S. Mitchell,* chairman of the board; *Daniel M. Dent,* vice chairman; *Dr. W. R. Johnston,* executive vice president; *C. W. Kaufman,* vice president in charge of activities; and *F. N. Peters,* treasurer. *Roland A. Isker* was re-elected secretary.

Boyce Elected D. J. Murray Pres. for 18th Straight Year—Others Chosen

Elected to serve his eighteenth consecutive year as president of D. J. Murray Manufacturing Co., Wausau, Wis., Fred C. Boyce has also been chosen a director of the firm for the thirtieth consecutive year.

Other officers re-elected were A. W. Plier, executive vice president and general manager; M. P. McCullough, Chicago; and D. C. Everest, vice presidents; C. L. Durkee, vice president and sales manager; George L. Ruder, treasurer; W. A. Marquardt, secretary; Grover Keeth, assistant treasurer; P. W. Hoeper, assistant secretary.

Mr. Plier, Mr. Hosper, Mr. Keeth, Mr. Ruder and Mr. Durkee were also re-elected as directors.

Frank W. Wolcott Appointed General Mfg. Mgr. of Wyandotte Chemicals

The appointment of Frank B. Wolcott, formerly in charge of manufacturing operations for New Jersey Zinc Co., has been appointed general manufacturing manager of Wyandotte Chemicals Corp., Wyandotte, Mich.

Joining New Jersey Zinc as an engineer in the firm's West Virginia mines, he was promoted to successively responsible positions in the Palmerton, Pa., mines of the zinc firm. He became superintendent in 1948.

As general manufacturing manager Mr. Wolcott will supervise Wyandotte chemical, compounding, quarrying, mining and transportation activities, most of which are now being expanded.

Scott Paper Personnel Changes

Four changes in production personnel are being made at Scott Paper Co. plants. Gilbert L. Heath, Fort Edward (N.Y.) paper mill superintendent, will become production manager of the Chester (Pa.) plant late in July. He will be succeeded by Nathaniel G. McLean, presently a division manager at the Fort Edward mill.

Late last month Fred Herbolzheimer, Jr., technical control director at the South Glens Falls (N.Y.) plant, became assistant superintendent of pulp preparation at the Chester plant; Richard Mooney of the Chester plant succeeded Mr. Herbolzheimer at Glens Falls.

Roger L. Main, formerly vice president and treasurer of St. Joe Paper Co., Port St. Joe, Florida, has now been made president of the company. He succeeds Edward Ball, who becomes chairman of the board.

Frank B. Wolcott

Ernest Smith

Ernest Smith Made Canadian Representative for Gibbs-Brower

The appointment of Ernest Smith as its sole representative in the Dominion of Canada has been announced by the Gibbs-Brower Co., Inc., New York City.

Mr. Smith is well acquainted with the industry and is widely known in the paper converting field in both the United States and Canada. He was formerly vice president of the Appleford Paper Products, Ltd., and production manager of its Hamilton and Montreal plants prior to his retirement in 1950.

Robt. E. Young Becomes Director, Ohio Boxboard—Morris Now a V.P.

The election of Robert E. Young as a company director has been announced by The Ohio Boxboard Co., Rittman, Ohio. Concurrently, James C. Morris was chosen vice president of production in an election which retains all other company officers.

Mr. Young replaced his father, Don Young, as a member of the board. Associated with Ohio Boxboard for the past five years, the junior Mr. Young will retain the post of secretary which he has held for the past year.

Mr. Morris has been associated with the firm for fourteen years. During that time he has been manager of research and development and production manager.

C. A. Thomas Is New President of Monsanto Chemical Co.—Wm. M. Rand Retires

One of the nation's leading atomic scientists, Dr. Charles Allen Thomas, took office as president of Monsanto Chemical Co., St. Louis, on May 25. Dr. Thomas replaces William M. Rand, retiring under Monsanto's pension plan, in the post.

Dr. Thomas, prominently identified with production of the atomic bomb and co-author of a plan for control of nuclear weapons, has served as Monsanto's exec-

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utive vice president since 1947. He began his industrial career with General Motors, where he aided in development of Ethyl gasoline; he later established research laboratories of his own in Dayton, Ohio. In 1936 Monsanto acquired these Dayton laboratories and Dr. Thomas became Monsanto's research director. Successive executive appointments, culminating in the present appointment, followed.

Mr. Rand, retiring after more than 20 years of service to Monsanto, began his career with Merrimac Chemical Co., Everett, Mass. When Merrimac was acquired by Monsanto in 1929, Mr. Rand —then Merrimac president—became Merrimac Division general manager and a Monsanto vice president. In 1943 he was named a member of the Monsanto executive committee, and president of the firm in 1945.

Sterling Electric Motors Makes Additions to Staff

The following additions to its sales and engineering staffs are announced by Sterling Electric Motors, Inc., Los Angeles:

San Francisco—John F. Ingle, district manager with offices at 1066 Howard St., to serve Central and No. California and Western Nevada.

Houston—Robert P. Killion, district manager, with offices at 1213 Capitol Ave., serving SE Texas.

Baltimore—H. L. Fritz, 1667 Argonne Drive, serving Maryland.

Birmingham—Edmond W. Hodge, Jr., 1727 Sixth Ave., North to serve Alabama.

New York City—Joseph P. Foley, Chas. E. O'Leary and Raymond S. Portner added to this district office at 385 Gerard Ave.

Los Angeles—Melvin Maxham and John Malloy have been added to the headquarters' sales staff.

R. G. Runyan, purchasing agent of the Purchasing Department of the Hazleton, Pa., plant of Oliver United Filters Inc., has moved his offices to the company's Oakland, Calif., headquarters. At the same time, *W. F. Gates,* previously assistant personnel manager of the Hazleton plant, was named assistant purchasing agent in charge of the Hazleton Purchasing Department.

J. W. Gillespie, well-known Flexible Steel Lacing Co. representative for Texas, Louisiana, Arkansas and Oklahoma, has been called back to active military service. The company will keep the territory open for the present, in anticipation of his return.

Lonsdale Retires—Dodd Given Manufacturing Duties by Foster-Wheeler Corp.

Upon the retirement of William Lonsdale, vice president of manufacturing for Foster Wheeler Corp.'s Carteret, N.J., and Danville, N.Y., plants, Gerald D. Dodd, assistant to the company's president, assumed the manufacturing responsibilities.

Mr. Lonsdale, who has now passed the mandatory retirement age of 70 years, will be retained as a special consultant prior to his full retirement. Joining Wheeler Condenser and Engineering Co., Foster-Wheeler's predecessor, in 1907, Mr. Lonsdale served first as a construction engineer. In 1921 he was made works manager, and in 1936 became vice president in charge of manufacturing.

Mr. Dodd's affiliation with Foster Wheeler began in 1929, when he was placed in charge of the Heater and Evaporator Group. He became assistant to the president in 1950.

Stuart E. Kay and *F. Henry Savage* were elected vice presidents of International Paper Co., New York, at a recent company election. Mr. Kay has been manager of manufacturing of Northern Mills since 1936; Mr. Savage was appointed assistant general sales manager last January. Both men will continue to hold their earlier responsibilities.

Joseph S. Hawkins, formerly sales manager of the Coating, Labeling and Latex Cementing Division of Potdevin Machine Co., Brooklyn, N.Y., has been appointed general manager of the same department. Mr. Hawkins has been associated with Potdevin for the past 22 years.

Lawrence K. Cecil was elected vice president of Infilco Inc., at a recent meeting of the company's board. General sales manager for Infilco since 1950, Mr. Cecil has been associated with the company as sales engineer and district manager for the past 25 years.

C. T. Hendrix has joined A. O. Smith Corp., Milwaukee, as LP-Gas carburetion sales specialist. Formerly associated with Nash Motors Division of Kelvinator Corp., Mr. Hendrix will now work with dealers and distributors on carburetor conversion sales; additionally, he will conduct LP-Gas schools for dealer salesmen, and will supervise installation of Smith-marketed carburetors on large fleet accounts.

Frank T. Peterson, deputy managing director of B-C International, Ltd., British subsidiary of Black-Clawson Co., Hamilton, Ohio, is returning to America this month to accept transfer and promotion to a position representing Black-Clawson, Shartle, Dilts in America. He will join B-C at company headquarters to work in the engineering and sales of fourdrinier machines.

Willard T. Pennington, formerly manager of the Birmingham district of Scott Paper Co., has been named chief consumer's representative for the Chester, Pa., plant of the firm. Beginning his association with Scott in 1935, Mr. Pennington has since served as a retail salesman in the Augusta area, and as district manager of several territories.

Kenneth W. Montford, former assistant manager of Northwest Wholesale's Chemical Supply Department, Wenatchee, Wash., has become district sales representative of the Portland, Ore., district of Pennsylvania Salt Manufacturing Co., Philadelphia. He will service Oregon, Colorado, Utah and Southern Idaho consumers of Pennsalt agricultural and industrial chemicals.

Robert W. Suman has been appointed chief engineer of the Philadelphia plant of Link-Belt Co., Chicago, upon the retirement of *William S. Campbell.* Mr. Suman, associated with Link-Belt since 1934, has been chief engineer for power transmission products of the Philadelphia plant since 1946.

John F. Hagar has been appointed to the sales management staff of Gardner Board and Carton Co., Middletown, Ohio. Mr. Hagar was formerly sales manager for Falls Paper and Power Co., Oconto Falls, Wis.

R. W. Hooker, vice president in charge of sales for Hooker Electrochemical Co., Niagara Falls, N.Y., has been elected a director at large of the Armed Forces Chemical Association. Mr. Hooker is a charter member of the Association; the Hooker firm is one of its nine sustaining members.

Colin Gardner, executive vice president of The Gardner Board and Carton Co., Cincinnati, has been named a member of the OPS Advisory Committee for the Boxboard Industry.

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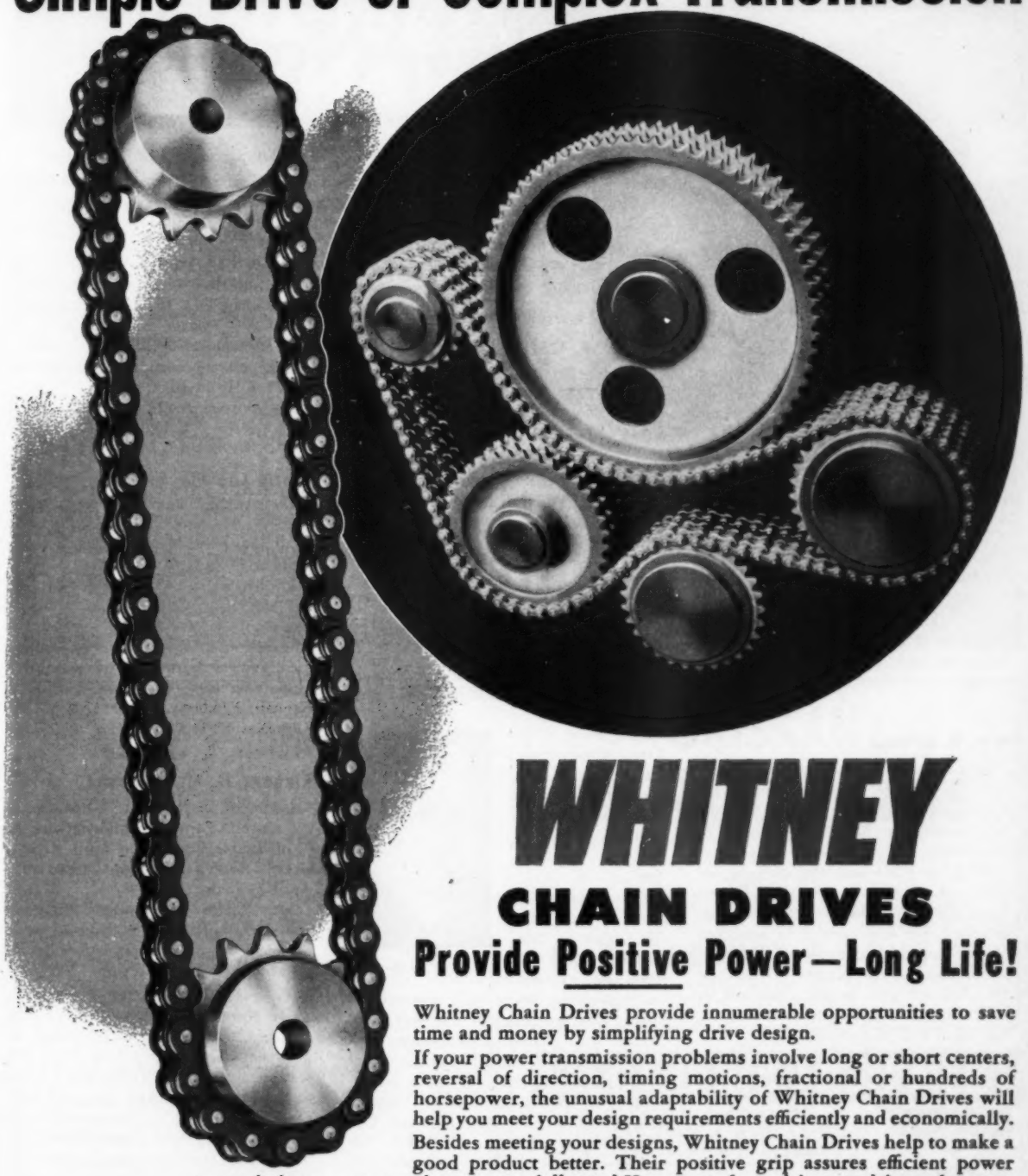

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The Paper Industry Necrology

Franklin Olin

Founder and director of the vast Olin Industries, Franklin Olin, passed away May 21 in St. Louis, Mo. He was 91 years of age.

Born in a primitive lumber camp near Woodford, Vermont, Mr. Olin attended school only part time as a boy. However, he entered Cornell University and graduated with an engineering degree in 1886. During his college years he taught school and played professional baseball to meet his expenses. He was also prominent in athletics during his college years.

Among the subsidiaries of the Olin Industries are Western Cartridge Co., and Western Brass Mills, of Alton, Ill.; Winchester Arms Co. and Bond Electric Corp., both of New Haven, Conn.; and the Ecusta Paper Corp., Pisgah Forest, N. C.

Mrs. Olin survives her husband, as do two sons: John M., president of Olin Industries, and Spence T. Olin, first vice president of the company.

Wm. B. Milham

Long identified with the papermaking industry, finance, and agriculture in Kalamazoo, Michigan, William B. Milham passed away May 11 at his home in Kalamazoo. He was 93 years of age.

Fifty-five years ago, Mr. Milham became associated with the then Bryant Paper Co., which had recently been established. He later served as president of the company, then as board chairman. In addition to his success in business, Mr. Milham was deeply interested in agriculture; his main interest was his fine farm near Kalamazoo.

Survivors include three sons: Allen B. and Irving A., of Kalamazoo, and Wayne W., Scotts, Mich., also, one daughter.

W. C. Powers

A prominent newsprint authority for the past 50 years, W. C. Powers, passed away in London, England, on April 25.

Mr. Powers' association with the newsprint industry began in 1888 when he joined Glenn Manufacturing Co., Berlin Falls, N.H.; from 1898 to 1910 he was manager of the Great Britain division of the International Paper Co.

Manager of sales and a director of Great Northern Paper Co. from 1912 to 1919, Mr. Powers had for the past 20 years been associated with Peter Dixon and Sons, Ltd., newsprint manufacturers with mills at Grimsby and Oughtibridge, England.

Harold F. Cotter

Former chemical engineer at the Bureau of Tests, International Paper Co., Harold F. Cotter passed away suddenly April 30. He had been professor of chemistry at the University of Alabama since 1937.

Professor Cotter attended M.I.T., and worked in the I.P. Company's mills in New York, Maine, and Canada.

He is survived by his widow and twin sons.

Jacob Darre Jenssen

One of the most celebrated persons known to the paper industry field was Jacob Darre Jenssen, of New York City, who passed away April 16 at the age of 74. He was a co-founder of the G. D. Jenssen Co., Watertown, N. Y.

J. D. Jenssen

Mr. Jenssen was born in Norway. He came to the United States in 1900 and engaged in engineering design with several pulp and paper consultants. He was associated with Hardy S. Ferguson until 1905 when he returned to Europe. After spending some time over there, he returned to North America in 1909 as chief engineer for the Riordan Co., Hawkesbury, Ontario. In 1915, together with his brother, Gunnar D. Jenssen, he founded the firm of G. D. Jenssen Co.

Mr. Jenssen introduced the reversible two-tower system of sulphite acid making which is used in the majority of the pulp and paper mills throughout the world. There are installations in North and South America, Europe and Asia. Many mechanical developments are attributed to Mr. Jenssen, particularly in the field of acid making. He designed several pulp mills and contributed process improvements in almost every sulphite pulp mill that has been built since 1920.

The G. D. Jenssen Co. was incorporated in May, 1944, with Mr. Jenssen as president. In 1949, he relinquished his official capacity as an officer to remain as technical consultant and advisor to the company. Gunnar D. Jenssen passed away in 1942.

Mr. Jenssen is survived by a sister in Norway.

Austin Lee Ely

Director of manufacturing for Kimberly-Clark Corp., Neenah, Wis., was fatally injured in an automobile accident while on his way to work May 25.

Prior to the first World War, Mr. Ely was a teacher of chemistry. During the war, he was a gas warfare instructor in England. After the war, he headed the chemistry department for Kimberly-Clark, serving the firm's plants at Neenah, Kimberly, Niagara, Wis., and Kapuskasing, Ontario.

Richard H. M. Robinson

Chairman of the board of Minnesota and Ontario Paper Co., Minneapolis, until his retirement early in April, Richard Hallett Meredith Robinson passed away April 23 at the age of 78.

Mr. Robinson organized Minnesota and Ontario in 1932, and served as its president for many years before assuming the board chairmanship.

T. M. Heermans, asst. manager of sales, Allis-Chalmers centrifugal pump department, passed away May 17 in Milwaukee at the age of 62. He was a leader in the development and design of Allis-Chalmers line of close-coupled type single-suction pumps. He served as president of the Hydraulic Institute in 1949. Prior to that, he had been its vice president, chairman of the nomenclature committee and a member of the executive committee.

William James Stutt, Canadian paper-mill operator, passed away May 3 at West Flamboro, Ont., Canada. Mr. Stutt, who was 94, operated mills at Todmorden and Greensville, Ont., for many years. Four children survive.

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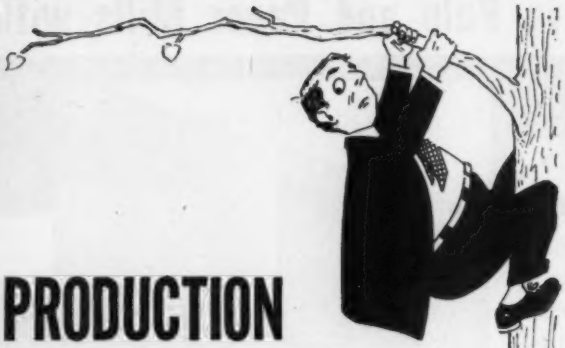

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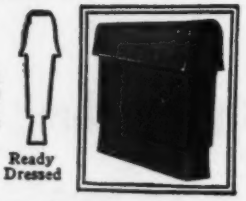

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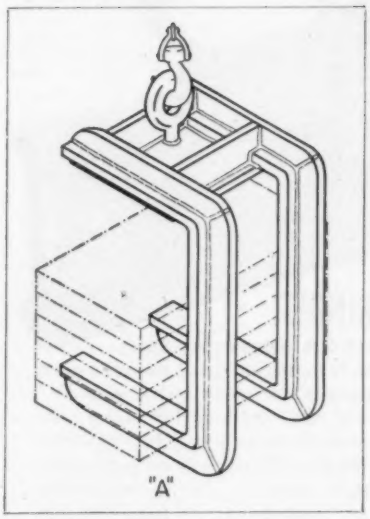


Homemade Self-Loading Pick-up Element

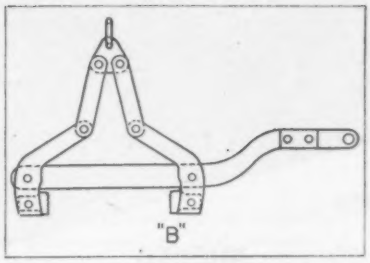
A simple device which company engineers designed to eliminate manual lifting of 200-lb. bars of phosphor bronze, nickel silver, cupre nickel and berylium copper alloys has been in use at the Riverside plant of this company. Although used for this specific purpose, other companies can adapt the design to their products simply by varying the dimensions to fit the products in question. Among typical items to which the pick-up element can be applied are textiles, paper, and plastics.

The device is used to carry six bars at a time from shears to flat breakdown and from flat breakdown to annealing and back. The 200-lb. bars are stacked on pallet blocks and when a load is to be moved, the pick-up device slips under the load, much as a fork truck would, and an electric hoist or crane picks up and transports the loaded element. Previously, bars were hand loaded into lifting mechanisms.

The eye which engages the hoist hook is mounted toward the open end of the device so the center of gravity tilts the load back and "cradles" it, thus preventing it from spilling.

As indicated in drawing "A" the lifting element resembles two giant "C" clamps, welded in parallel. The device is constructed by bending two flats into "C" shapes, reinforcing with additional flats welded perpendicular to the outer sides of the "C" flats, and joining the two by welding connecting members as indicated.

A second device (drawing "B") has been designed for handling individual bars when feeding them into or taking them out of machines. This mechanism operates by the



tong principle and permits one man to handle individual bars when feeding machines or stacking pallet-blocks. It also was designed and built to solve a specific Riverside problem, but can be applied to other handling problems as well.—RIVERSIDE METAL Co., Riverside, N.J.

Handling, storage and inspection of grinding wheels

Handling

All grinding wheels are breakable and some are very fragile. Great care shall be exercised in handling and storage to prevent damage which might cause a wheel to fly apart when brought up to speed. The following rules, which are based on experience, shall always be observed.

(a) Handle wheels carefully to prevent dropping or bumping.

(b) Do not roll wheels (hoop fashion).

(c) Use trucks or suitable conveyors which will provide proper support for all transportation of wheels which can not be carried by hand.

Exception to (b) and (c): Where it is impractical to comply with (b) and (c) because of large size of wheel, danger of damage when rolling the wheel will be minimized if floor is smooth, clean and free from obstructions. The use of a strip of rubber or cork matting will further reduce the danger.

(d) Stack wheels carefully on trucks. Do not pile heavy castings or tools on top of them, or permit wheels to topple over.

Storage

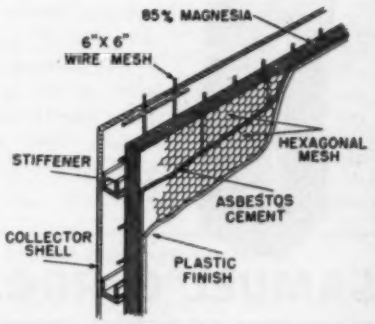
Suitable racks, bins or drawers shall be provided to accommodate the various types of wheels used.

Wheel storage rooms should not be subject to extreme temperatures, and should always be kept dry.

Inspection

Immediately after unpacking, all wheels shall be closely inspected to make sure that they have not been injured in transit or otherwise. As an added precaution, wheels should be tapped gently (while suspended) with a light implement, such as the handle of a screw driver for light wheels, or a wooden mallet for heavier wheels. If they sound cracked, they shall not be used.

Wheels must be dry and free from sawdust when applying the test, otherwise the sound will be deadened. It should also be noted that organic bonded wheels do not emit the same clear metallic ring as do vitrified and silicate wheels.—From *Grits and Grinds*, published by Norton Co.



Detail of equipment insulation to prevent condensation

Insulation Helps Avoid Condensation Corrosion

Corrosion of equipment due to condensation of moisture from hot gases can be avoided by insulating the heated equipment. A typical use of insulation for this purpose is illustrated by a recent installation at the downtown steam plant of a Baltimore public utility.

To prevent air pollution by smoke from the boilers, giant dust collectors on the roof of the plant clean the smoke before it goes out through the stacks. The temperature of the metal collector shells must be kept between 280-300 F., since condensation and the resulting corrosion would increase maintenance requirements and reduce the life of the collectors.

This degree of temperature control was obtained by insulating the collectors with a layer of 1½ in. thick 85 per cent Magnesia blocks. The insulation was applied over 6 in. x 6 in. wire mesh welded to the exposed angle stiffeners of the collectors. A layer of 1½ inch hexagonal wire mesh was then applied, and covered with a ½ in. thick layer of asbestos cement.

Because the installation is outdoors, the insulation was given a weather resistant finish. A layer of 1 inch hexagonal wire mesh was stretched over the asbestos cement, over which weather-resistant asphaltic asbestos plastic was troweled on.—THE MAGNESIA INSULATION MANUFACTURERS ASSOCIATION.

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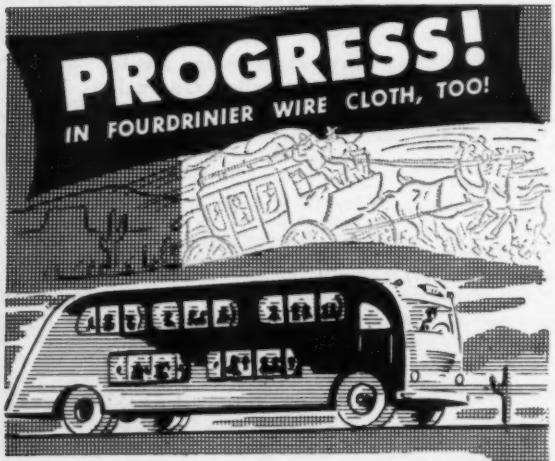

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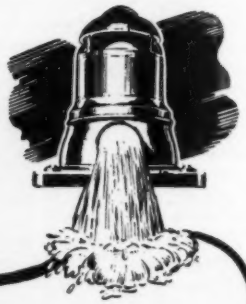

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Foreign Abstracts . . . . . .

Opacity of pulp

The author reviews briefly methods for measuring opacity, and indicates that the correct way of reporting the opacifying properties of a pulp is *not* as opacity values (such as contrast ratio or printing opacity) but as the scattering coefficient. A method is outlined for calculating this coefficient from opacity measurements by using the Kubelka and Munk formula. A suitable diagram (cf. Figures 3a and 3b) for this calculation, scattering power (SX) is also given. It was shown that within certain limits, the scattering coefficient (s) is not seriously affected by either sheet thickness or the wave length of the light used (between wave lengths of 4000 and 7000 Angstroms). For example, in the case of a soft sulphite pulp the specific scattering coefficients ranged from 424 to 431. (The pulp had basis weights ranging from 35.8 to 81.7 grams.) The test sheets used (about 60g./m².) were formed on a Swedish standard sheet machine, and were pressed between blotting paper at 5 kilos per sq. cm. for seven minutes. They were dried between blotters at 60 C. Brightness (Roo) and printing opacity $\left(\frac{Ro}{Roo}\right)$ were measured in the Hunter Multi-purpose Reflectometer (using filter G) with black velvet as the background. No differences in s were noted when the line voltage varied between 200 and 330 volts. The basis weight (grams per sq. cm.) was measured after conditioning the sheet at 20 C. and 65% relative humidity. The scattering coefficients (s) of various pulps calculated from the foregoing values ranged from approximately 100 to 600 (using units employed by other workers such as Van den Akker and Nordman). Twenty-six references are given (most of which are to the American literature). Hans Wilhelm Giertz. *Svensk Papperstidn.* 21, 673-680 (1950). (Original in Swedish with English summary.)

Bitumen emulsions in waterproofing papers and boards

Pitch and bitumen emulsions may be used satisfactorily as beater additives provided certain precautions are observed. Sieving the emulsion through a 60-mesh screen just prior to its addition to the beater appears essential because a skin may have formed in the barrels, the redispersion of which may prove difficult. When waterproof boards are to be manufactured, the *p*H of the stock should not drop below 7. If soft water is used, lime should be added to produce hardness. The beater roll should be raised before addition of the emulsion, and excessive beating should be prevented. The final *p*H of the stock should be *p*H 4.5 (adjusted by the addition of alum). All points at which air may be entrained should be carefully checked so as to reduce foaming to a minimum. Ordinarily, the addition of a pitch emulsion to stock reduces its freeness so that a concomitant operational speed reduction may be necessary. Drying should be carried out as gradually as possible.

A wet doctor or a wax-emulsion doctor should be used on the calender. Rolls of the calender should be heated to about 180 F. The calendering operation is of importance. The more effective this process, the greater will be the water resistance of the board. Broke can be reused, and repulped in a pulper or by steam digestion. However, repulping may be somewhat difficult in an ordinary beater unless live steam is used and the stock temperature kept above 70 C. British Bitumen Emulsions, Ltd., *Worlds Paper Trade Rev.* 135, No. 3, 196 (Jan., 1951).

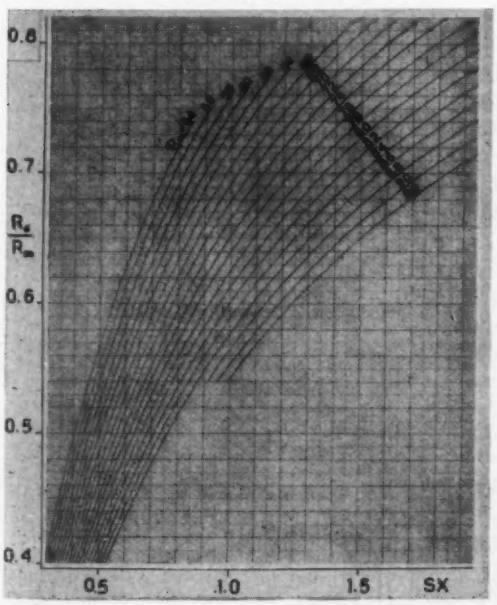
Basalt lava beater tackle

Properties of lavas from various deposits in Germany are outlined. The most suitable lava for beater tackle is very porous, with the openings evenly distributed throughout the stone. Of these the *Tephrite lava* (from Niedermending and Mayen) is the most suitable. Its structure is compared with that of *Basanite lava* (which has fewer and larger pores).

Advantages of using a stone tackle for hydrating bag, glassine, tissue, cable and other paper stocks are discussed. Fibrillation is attained without cutting the fibers, and beating is effected in a much shorter time and with lower power consumption than with metal tackle. Two photomicrographs are included. J. Krieger. *Wochenbl. Papierfabr.* 78, 662-4 (1950). (In German).

Water pollution problems caused by kraft mills

The effects of water pollution caused by sulphate mills cannot be determined in the same way that they can be followed in the case of sulphite pulp and paper mills; *i.e.* by ascertaining the hydrogen ion concentration, the oxygen content and the permanganate consumption of the water. The method in use of determining the poisonous effects of the liquor by tests on fish has the disadvantage of not being applicable for tests at the mills themselves. Improved



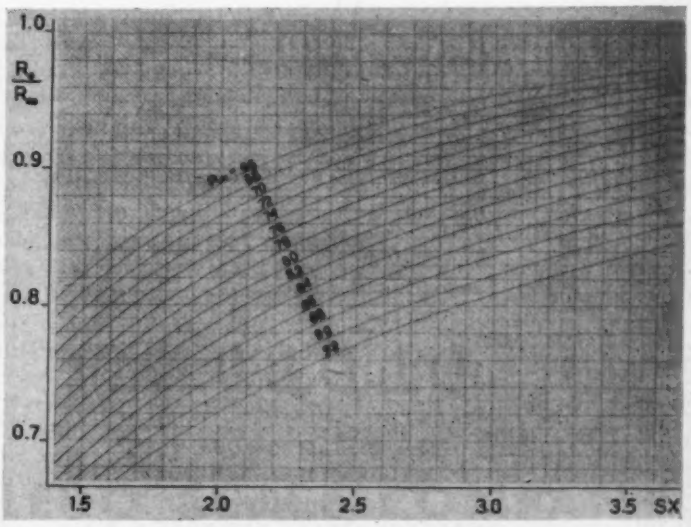


Fig. 3a (left)—Diagram for calculation of the scattering power SX from the measured values of printing opacity and brightness . . . Figure 3b (above)

analytical methods must be devised. Pollution effects from sulphate mills are confined to two sources: (a) the drain water from the diffuser and the screen room, and (b) the liquor condensate. The present article emphasizes the manner in which stream pollution from such sources has been reduced. Carl Gustaf von Essen. *Svensk Papperstidn.* 21, 690-693 (1950). (Original in Swedish with an English summary.)

Component in fusel oil from fermentation of sulphite waste liquor

This is a contribution from the Institute of Wood Chemistry, A°bo, Finland. When alcohol is produced by the fermentation of sulphite waste liquor, a certain fraction contains fusel oil. A newly investigated component of this fraction boiled constantly at 249.8-250.5 C. (at atmospheric pressure) and was isolated by using a "spinning-band column." Its density at 19 C. was 1.0496 and its apparent molecular weight was 166. This constant boiling fraction however, was an azeotropic mixture containing as one of its constituents the aromatic substance *1-propyl-3-methoxy-4-hydroxy-benzene,* isolated and identified by its 3,5-dinitro benzoate (melting 113.1-113.6 C.).

This required nine recrystallizations before it approached the purity of the synthetic product (with which it showed no melting point depression). It is probable that another closely related component is in the original azeotropic mixture, the study of which is being continued. The crystalline

Fig. 1—3.5 dinitrobenzoate of the fusel oil fraction boiling at 146.5° C/32 mm. Hg. Recrystallized 9 times from ether. M. p. 113, 1-113.6° C. (15 X)

structure of the dinitrobenzoate is shown in Figure 1. The presence of an aromatic compound (with the C_6-C_8 nucleus) in the alcohol fractions of fermented liquor is of marked interest. The study is being continued. Waldemar Jensen. *Paper and Timber* (Finland). 32, No. 11, 329-332 (1950). (Original in Swedish, with English summary.)

Moistening of wood used in grinding

The author attempted to develop a rapid practical method for increasing the water content of stored spruce logs from an initial 15-20% to about 26.0-28.5% water. Submersion required about 3 days, and floation required longer time periods; such procedures proved uneconomical for mill practice. Up to a point the rate of water penetration increased with increasing temperatures, and sapwood was penetrated more rapidly than was heartwood. Experimental data are given in block diagrams.

The rate of penetration evidently depends on the manner of preliminary drying; absorptivity being much lower in the case of very dry logs. Very favorable conditions were obtained when 1 meter logs were first evacuated 2 hours at 350 millimeters (mercury) and then soaked 2 hours at 3 atmospheres pressure. The results were practically the same as those obtained by merely soaking similar bolts for 47 hours. The effects of water penetration in the presence of low concentrations of alkali and sulphurous acid are also discussed. Karlheinz Klemm. *Das Papier* 4, 467-75 (1950). (In German.)

Calcium sulphate precipitation from supersaturated sulphite waste liquor

Good results were obtained when sulphite waste liquor was removed from pulp outside of the digester (with the pulp in part defibrated). The temperature during such removal however, is lowered, and there is an increased sulphate content in the liquor which has dissolved calcium sulphate from the fiber. Actually, the resulting liquor is supersaturated with regard to calcium sulphate, and there is serious risk of scale formation in the evaporators or in the alcohol fermentation plant. Using water solutions, the author has studied the effects of seeding in causing "de-supersaturation." Various seeding substances were used such as calcium sulphate [anhydrous and the dihydrate, calcium carbonate, calcium oxalate, barium sulphate, strontium sulphate, magnetite (Fe_3O_4) and sulphite waste liquor sludge]. Of these, calcium sulphate dihydrate proved the most satisfactory, and sulphate removal was favored by a relatively high temperature, thorough agitation and a high concentration of seeding substance. It was also found that in some instances the dihydrate was precipitated even when other compounds were used in seeding. The effects of ultrasonic treatment on the precipitation were studied but results were not promising.

In sulphite waste liquors, the results were similar to those obtained with aqueous solutions. However, here the *p*H of the liquor was a vital factor (as previously indicated by Samuelson, *Svensk Papperstidn.* 52, 283, 1949 and H. Vogt, *Swedish Patent* 120,794). The present author studied "de-supersaturation" as a function of temperature, concentration of the seeding substance (i.e. $CaSO_4.2\ H_2O$) and *p*H, and showed that the most favorable conditions were a high temperature (*ca.* 70 C. or more), high concentration of the seeding substance, and thorough stirring at *p*H 3. Thus sulphate concentrations as low as 1.1 grams per liter could be reached. A high concentration of the sulphate in the liquor is actually favorable because it permits precipitation of many seeding points in the liquor. The process was also studied on a pilot plant scale. The process was preferably carried out in two steps (as suggested by Vogt). The first step included seeding at *p*H 3, whereas the second step involved "neutralization." Whether or not sedimentation is required between these two steps depends on the

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conditions for dissolving sludge (in the second step). With moderate stirring in this step, the risk is slight provided the *p*H of the liquor is not raised above 5. Under these conditions the liquor is not saturated, and subsequent distillation may be carried out with less chance of scale formation. The Technology of the process is discussed. Ten references and 16 tables are given. Alex Scholander. *Svensk Papperstidn.* 21, 681-689 (1950). (Original in Swedish with English summary.)

Two-sided effects in paper

Reference is made to the theories of Preston and Chen on the migration of dyes in textiles towards the source of drying (cf. *J. Soc. Dyers Colourists* 64, 60 (1948)). Certain properties of acid dyestuffs were studied with a view towards investigating their tendency to produce "two-sidedness" in papers. Handsheets were made under standard conditions and then dried either by suspending in air, or by ironing. No two-sidedness was noted when the sheets were air-dried.

On ironing, the dyes tended to concentrate on the side nearest the hot iron, unless they showed a marked affinity for the pulp or were fixed in some other way. The greater the moisture content of the sheet being varied, and the wetter the blotting paper on which the ironing occurred, the greater was this migration towards the heating surface. Certain dyes were precipitated by alum and fixed in this way. Others were fixed by a "size-alum" precipitate.

Of the dyes studied, those showing the greatest tendency toward producing two-sidedness were Alizarine Sapphire Blue 4G; Tartrazine, and Keton Red G, none of which showed much affinity for either pulp or size-alum precipitates, and were not themselves precipitated by alum. A. J. M. Draper. *Paper-Maker* (London) 121, No. 1, 30-3 (1951).

New pulps used in the viscose industry

Recent developments in the properties of rayon and tire-cord dissolving pulps are outlined. The use of such raw materials as beech, aspen, southern pines, and various hardwoods, various cooking and bleaching procedures, and purification methods are discussed. Whereas in rayon, a high brightness has been attained, certain filtration problems require further study. The resin content of rayon pulps is kept at about 0.15% or, when extractives are completely removed, the pulp may be treated with synthetic resins. The ash content is about 0.1%; manganese appears to reduce the aging period of the pulp.

For tire-cord dissolving pulps (which will compete with cotton linters), high strength properties (tear, twist and folding endurance) are required, with satisfactory elongation. To approach these, the tire-cord dissolving pulp is prepared from spruce sulphite pulps by continuous pressure purification. When other conifers and hardwoods are used, the kraft cook, with prehydrolysis and subsequent alkaline purification is used. Tire-cord wood pulp has, however, not yet reached the quality of cotton linters. Richard Bartunek, *Das Papier* 4, 451-5 (1950). (In German.)

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Insect Electrocuting Panels

An all-metal electrocuting panel 28 in. high and 24 in. wide is said to give highly satisfactory results in solving the problem of night-flying insects drawn to lighted areas. It is used with a strong light and is installed at all points to which the insects are drawn, particularly near flood lights and other first points of attraction. The insects are electrocuted as they circle the charged screen of the panel.

Known as Model IP-59, this panel is constructed of rust-resisting metals and uses a negligible amount of current. Operation is continuous. Detjen Corp., 303 W. 42nd St., New York 18, N.Y.

Screens

In the Gyro-centric Screen Unit, two screens are compactly assembled on a common support frame and driven by a single motor, eliminating virtually all vibration. Thus the unit may be installed anywhere, without rigid support.

The screens may be used for sawdust, metal powders, soap powders, and many other materials. The twin mounting doubles production over conventional models. Clean, accurate separations are guaranteed. The Patterson Foundry & Machine Co., East Liverpool, Ohio.

Electric Hoist

A line of Speedway electric hoists is now available in capacities from 250 to 1000 lb. Known as "Frame B" models, they are basically the same as the older Frame 1 models but are lighter and better balanced. As the highest capacity is 1000 lb., these hoists use two parts of 3/16-in. cable, a smaller load hook and a smaller trolley. They are ideal for hook suspension. The hoists have shaved gears and the lower limit switch is standard equipment. Wright Hoist Div., American Chain & Cable Co., Inc., Bridgeport 2, Conn.

Car Shakeout

A vibrating mechanism to be attached to railroad cars will shake out coal, sand, crushed stone, etc. from hopper-bottom cars. The shaker is motor-powered and easily attached to the car; one man can attach and operate it. With it, a 50-ton car can be unloaded in four to seven minutes.

The unit is lightweight (1250 lb.) and simple in construction. A steel bar clamps the shaker to the underframe of the hopper and fastens to the screw of the shaker. A cam-shaking mechanism, the shaker is available with a wheel cart, a job crane or an overhead mono-rail for mounting to the car. National Conveyor and Supply Co., 353 N. Harding Ave., Chicago 24, Ill.

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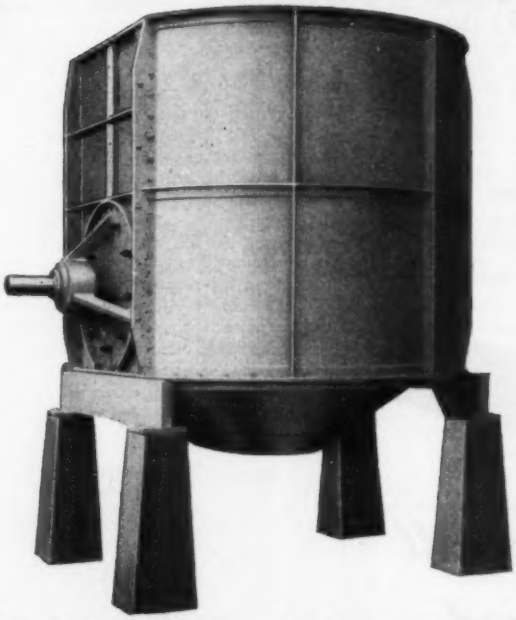

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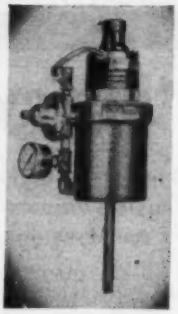

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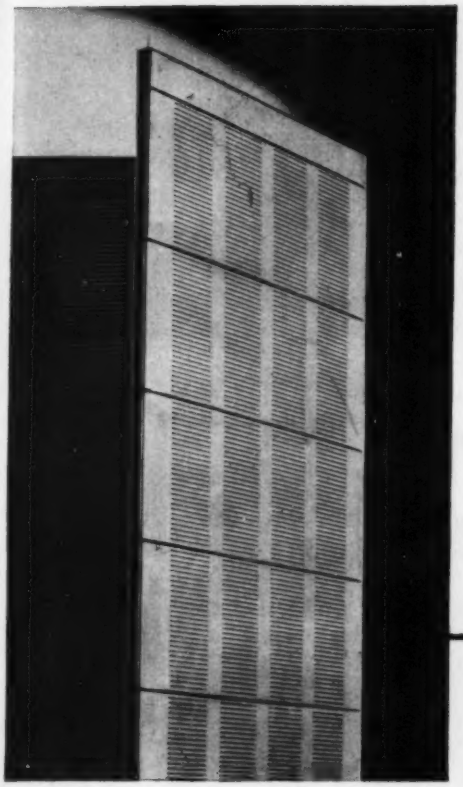

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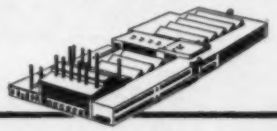

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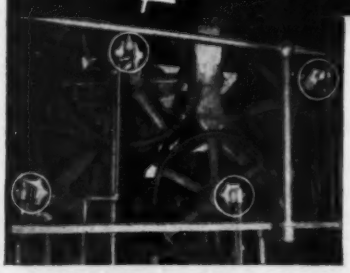

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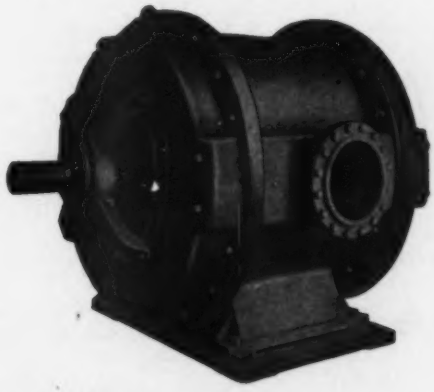

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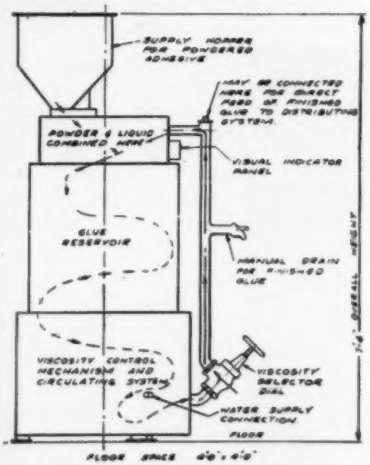

Dry Adhesive Converter

The Triangle Visco-Mat is a machine that automatically converts dry adhesives into a ready-to-use liquid glue of the correct viscosity. It measures and mixes water needed to produce viscosity as indicated by setting a simple control dial. It may be connected for direct feed of finished glue to the distributing system, or the glue can be withdrawn through a manually operated drain, if preferred. For glue application on which the adhesive manufacturer does not recommend the use of dehydrated adhesives, the Visco-Mat can be equipped for handling heavy or viscous adhesives, and automatically diluting and converting them into liquid glues of the correct viscosity. Triangle Package Machinery Co., 6633-55 W. Diversey Ave., Chicago 35, Ill.

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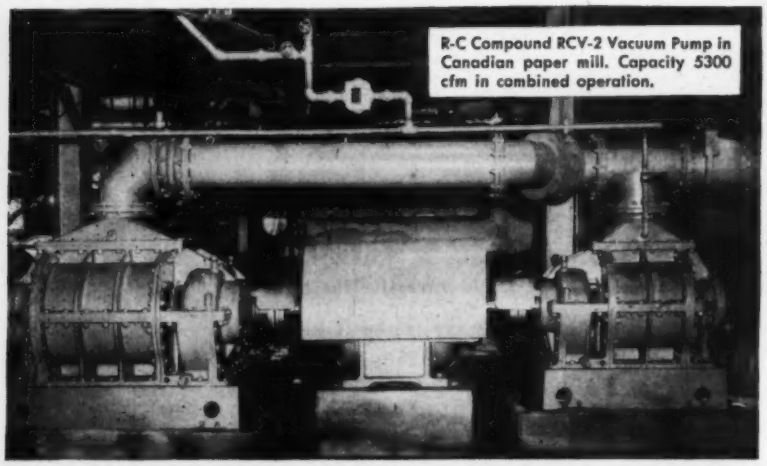
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4. **FLEXIBILITY**—to meet varying demands; suction automatically overcomes resistance in system.
5. **DEPENDABILITY**—long-time, attention-free operation, due to simplified design and construction.

Ask for details on R-C Vacuum Pumps and other equipment to handle gas and air in paper mill operation.

Roots-Connersville Blower Corporation
510 Monroe Avenue, Connersville, Indiana

ROOTS-CONNERSVILLE
BLOWER BUILDERS SINCE 1854
ONE OF THE DRESSER INDUSTRIES

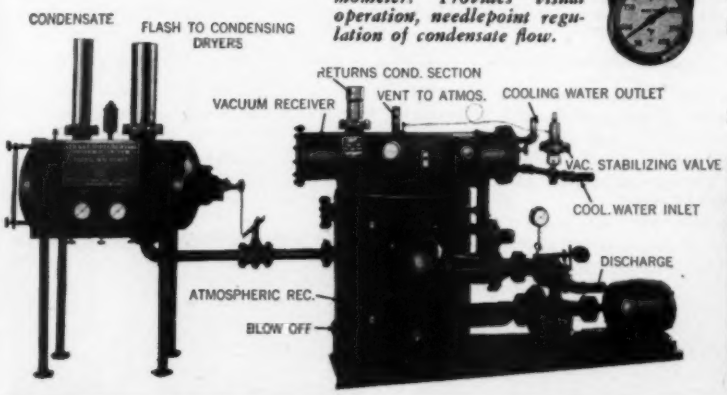
Cut your steam costs with Improved Stickle Vacuum Differential Drainage!

Featuring the all-new Stickle Vacuum Pump

Applied to your driers, improved Stickle Vacuum Differential Drainage will rapidly remove air and condensation, boosting production efficiency . . . return condensate to your boiler room at maximum temperature, cutting your fuel costs 10-15%.

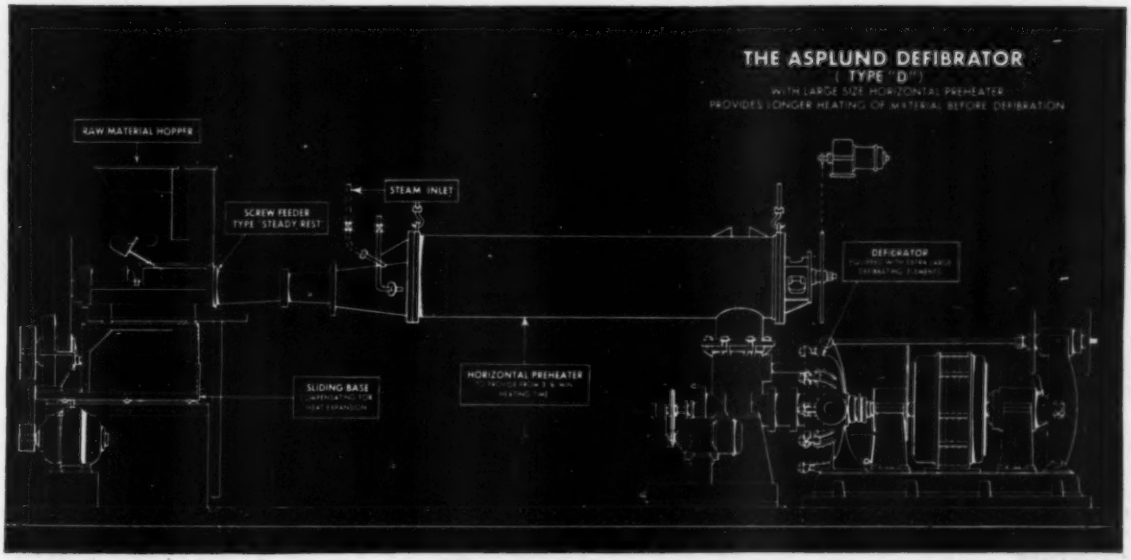
Whether your machines operate at above- or below-atmospheric pressure, proper drainage is assured. Pressure changes require only simple resetting of pump controls. New Stickle Pump, with accent on accessibility, greatly simplifies inspection and maintenance. Has *exterior* float boxes; interchangeable vacuum chamber *above* tank; standard horizontal motor and pump. And built-in heat exchanger eliminates costly cooling equipment.

Stickle Micro Adjustable Orifice with Indicating Thermometer. Provides visual operation, needlepoint regulation of condensate flow.



For positive, uninterrupted circulation of steam—*at a positive saving*—specify *improved* Stickle Vacuum Differential Drainage. Send for *free* Stickle Bulletins 160 and 600.

STICKLE STEAM SPECIALTIES COMPANY
2215 Valley Avenue Indianapolis, Indiana



The Defibrator produces superior pulp for wallboard, hardboard, insulating board, corrugating board, and roofing felt from all kinds of chipped wood or other fibrous ligno-cellulose materials such as bagasse or straw.

The process can be controlled to produce or duplicate any desired degree of freeness or fineness of fibre. Pulp is homogeneous with all fibres intact, but well separated. Yield is high and power costs are low.

AMERICAN DEFIBRATOR, INC. CHRYSLER BUILDING NEW YORK 17, N.Y. *West Coast:* A. H. Lundberg Orpheum Building, Seattle, Wash.

which the differential pressure is continuously balanced by a pneumatic pressure. This pressure becomes a measure of the fluid flow and is connected to a recording or controlling instrument. The unit offers a 750 or 1500 psi rating and is made of Type 316 stainless steel or carbon steel. Minneapolis-Honeywell Regulator Co., Brown Instruments Div., Wayne & Windrim Aves., Philadelphia 44, Pa.

Strap Dispenser

Where long lengths of steel strap are required, either ¾-in. or 1¼-in. heavy duty steel strap can be handled with this electric motorized Coil Dispenser. It uncoils the strap along the floor so that when the desired length has been obtained the operator can cut it off with the manually operated shear. This model, No. 430, employs a 110V a-c motor with a positive chain drive. Special motors are available for other currents. A. J. Gerrard & Co., Melrose Park, Ill.

Hydraulic Hoist Truck

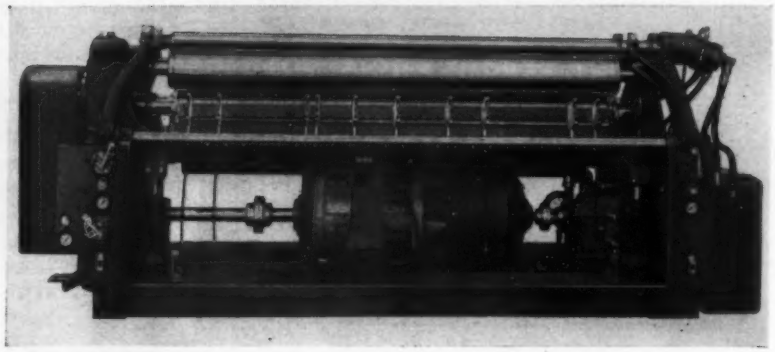
A 6000-lb. capacity electric fork truck features a single-cylinder hydraulic hoist system. Hoisting mechanism has been simplified so that there are fewer moving parts than in multiple chain-drive hoists; and the hydraulic cylinder is centered in the hoist frames, giving increased visibility of load and travelway. The hydraulic pump for hoist and tilt is direct connected to an electric motor, independent of the truck's travel motor.

Dimensions are: Over-all length of truck with 36-in. fork, 118 in.; over-all width, 42½ in.; height of upright telescoped, 83 in.; height of upright fully extended, 145 in. Hoist speed for full load is 20 ft. per min. going up, 40 ft. going down. Elwell-Parker Electric Co., Cleveland, Ohio.

Moisturizer

Any paper manufacturing or converting operation that requires added moisture during processing can be handled, it is claimed, without compressed air with the Flint "Twin Jet" moisturizer. Water alone, water mixed with chemicals, oils or emulsions can be used in the process.

Degree of moisturization is determined by setting one or both sets of twin-mounted jets for the desired operating range. Once adjusted, operation is uniform and consistent. Final control is through a single push button.

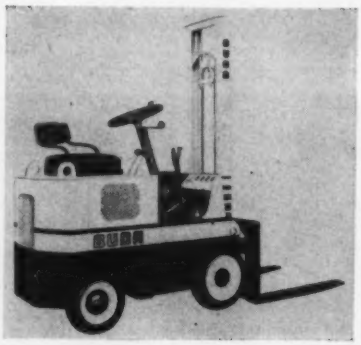


Duplex Rewinder

The B & S Duplex Rewinder No. 15 has 36 in. diam, rewind capacity, variable speed drive up to 1500 fpm, hydraulically driven differential rewind shafts and air-operated slitters which can make strips as narrow as ½ in. For roll widths from 42 to 92 in. Bagley and Sewall Co., Watertown, N.Y.

The "Twin Jet" was designed primarily for use on newsprint stock, and is ordinarily used between the last dryer and the calender rolls. However, it can be used at any point where rolls can be loaded with uniformity of control.

It is built in any size and is manufactured entirely of brass, nickel plated inside and out. The system is leased or sold. Flint Moisturizer, 1931 S. Tenth Ave., Maywood, Ill.



Fork Lift Truck

Buda's models FB20-24 and FB20-15 incorporate latest improvements in safety, comfort and operating advantages. Shorter length, shorter width and narrower turning radius are built into these 2000 lb. capacity models. One model has a 24-in. load center and the other a 15-in.

A new design single gear shift lever is mounted on the steering column, and a 9¼-in. diam. clutch is easily replaceable in 30 minutes. Power is supplied by a 4 cylinder, 61 cu. in. displacement engine. Lifts from 72 in. to 120 in. are available in five standard masts. Buda Co., Harvey, Ill.

Latex Coating

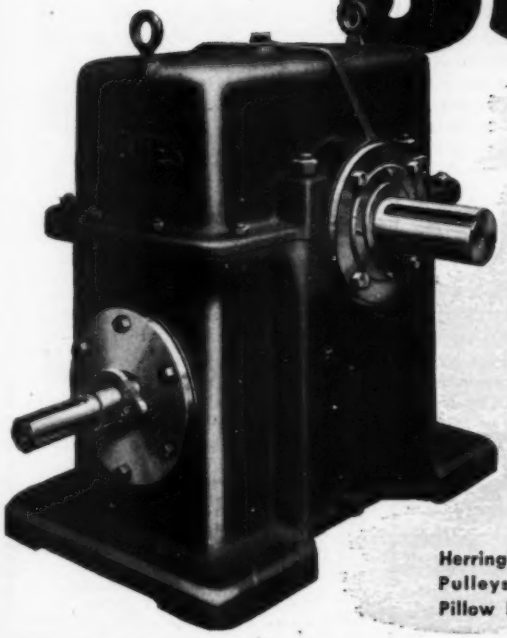
Dow Latex 744-B is the latest of the vinyl latices developed by this company, and is a functional coating material and pigment binder. It gives resistance to moisture, chemicals and grease in functional paper coatings and will produce durable, fire- and chemical-resistant paints, fabrics and coated wallboard. It is also weather resistant, and is finding widespread use for military application in the textile, paint and paper fields. Dow's original entry into the coatings field was the introduction of Dow Latex 512-K, a pigment binder for a wide range of coatings. Dow Chemical Co., Midland, Mich.

Load Meter

A new type of load measuring unit for paper machine rolls is reported to have substantially improved the uniformity of pressure control, thus improving thickness uniformity, tensile strength, density and finish of paper. The in-service test was made at the Clark, N.J. plant of United States Gypsum Co., where wall board is manufactured.

The new unit incorporates standard load cells based on SR-4 bonded resistance wire strain gages. Strain gage load cells permit direct measurement of roll loads, thus bypassing or eliminating all pin friction, knife edge friction, eccentric and misalignment loads, friction of piston packing or glands, piston leakage, and the inaccuracies of ordinary Bourdon type gages. The load measuring unit is essentially a short steel column on which SR-4 resistance wire strain gages are bonded. Used as a link in the bar carrying the press load, changes in tension change the electrical resistance of the fine wire grids

Jones



WORM GEAR SPEED REDUCERS

A right angle unit built for heavy duty performance in any industry. The worm can be above or below the gear. Shafts are single or double extended for coupling connections or chain or gear drives.

They are built in ratios from 4 to 1 to 90 to 1 and in capacities from ¼ to 100 H.P.

Bulletin No. 68 covers selection tables and dimensions.

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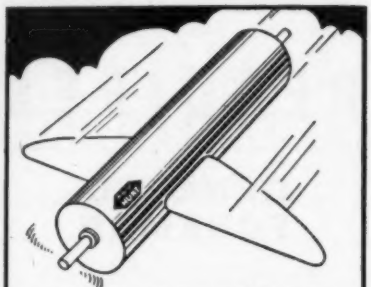

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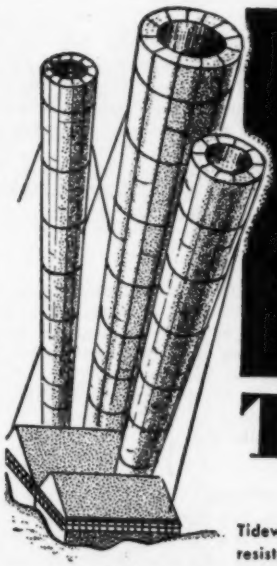

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Tidewater Red Cypress
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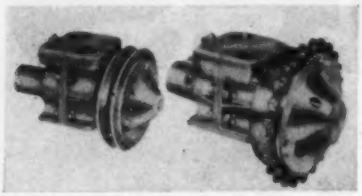
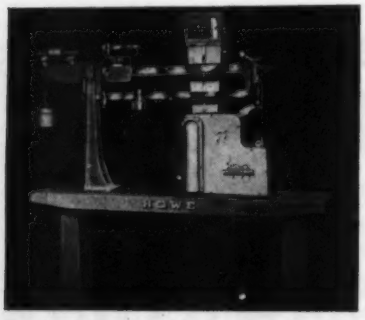
of the strain gages in the cell. Four gages in each load cell are wired together and connected with an instrument that automatically regulates roll pressure. Using standard load cells made by Baldwin-Lima-Hamilton Corp., the load meter is manufactured by Downingtown Mfg. Co., Downingtown, Pa.



Ball Bearing Pumps

Long life without servicing is the claim of the manufacturer of these ball bearing pumps. Two models are announced—a pulley drive and a sprocket drive type. Construction of both is such that lower transmission loads are absorbed by the pump housing without being transmitted to the pump shaft bearings. The drives are prepacked with lubricant and are fully sealed and shielded.

The pumps are available in Naval bronze forgings or stainless steel precision castings. They have capacities from 1/10 to 19 gpm, for use against pressures up to 150 lb. psi. They are reversible, operating in either direction without loss of efficiency. Both models are available with hydraulically balanced built-in by-pass. Eco Engineering Co., 12 New York Ave., Newark, N.J.



Scale Accessory

The Howe 77 Weightograph can be attached to any make of beam scale, or to any scale convertible to beam operation, converting it to an automatic scale of the latest type. It is simply attached to the beam shelf and connected to the beam with a rod. In weighing operations, the upward pull of the connecting rod swings the Weightograph chart in an arc between a stationary light and a magnifying lens. The beam is quickly stopped at the correct weight on the chart by means of an oil dashpot. The image of the weight is reflected, greatly magnified, on a screen and read off a mirror.

There are no complicated gears, friction discs, or weighing springs to get out of order, and the weight can be read without parallax from any angle. There is no zero change or inaccuracy with wide change in temperature. Thus, simple and trouble-proof operation is claimed for the 77 Weightograph. Howe Scale Co., Rutland, Vt.

New Product Briefs . . .

▸ ELECTRIC HAND TRUCKS—Two additions to the "101" line are the Transtractor, a driver-led unit for handling live and semi-live skids; and the Transtacker, a redesign job that is 10 in. shorter than its predecessor, and is made with a 70-in. lift. Automatic Transportation Co., 149 W. 87th St., Chicago, Ill.

▸ LIGHT BULB—A smaller 100-watt rough-service lamp is ¼ in. less in diameter and ¾ in. shorter than the standard 100-watt bulb. It will fit standard wire-guard extension-cord equipment. Westinghouse Electric Corp., Lamp Div., Bloomfield, N.J.

▸ FORK TRUCK—The FS-20 is part of a development program to provide 100 per cent functional fork trucks with complete comfort for the operator. This one carries loads up to 2000 lb. and 48 in. long. Baker Industrial Truck Div., Baker-Raulang Co., 1250 W. 80th St., Cleveland 2, O.

▸ ELECTRICAL MOISTUREPROOFING—A new synthetic wax, Wax S-1167, gives a moisture barrier to electrical coils that is at least 5 to 6 times more lasting than old type impregnating methods. Also a waterproofing and laminant for paper where its dark color will not affect the product. Glyco Products Co., 26 Court St., Brooklyn 2, N.Y.

▸ LIME REMOVAL—Crustex is an ultra-sonic wave producing apparatus which crystallizes lime particles in boilers and pipes, making removal easy and continuous. Velan Engineering Co., 1 Exchange Pl., Jersey City, N.J.

▸ CUTTING BLOCK—Nitrile type rubber is used in the Cut Rite Block, a cutting block designed for cutting paper, leather, cloth, etc. The Hycar rubber component provides a durable, efficient surface. Hycar is a product of B. F. Goodrich Chemical Co., and the Cut Rite is custom made by Rubber Engineering and Chemical Co., Lake Zurich, Ill.

▸ SAFETY LABELS—Brady Safety Signs and Pipe Markers are printed on heavy cotton cloth with an adhesive backing, and are used for marking over 550 different points. They conform to ASA Standard Z35.1-1941 for Industrial Accident Prevention Signs. W. H. Brady Co., 1602 E. Spring St., Chippewa Falls, Wis.

▸ FLOW DETECTOR—The Flow Detector-Amplifier is a low-priced electrical instrument for detecting discrete particles of liquid or solid falling onto a probe element. The detector gives one pulse of controlled width for each particle hitting the probe. Rochester Electronics Co., Inc., Box 227, Penfield, N.Y.

▸ FREIGHT TRUCK—Battery-operated, the Load-Mobile was developed for use as a pick-up or delivery truck. Long or short hauls are handled efficiently. Two capacities, 3000 and 5000 lb. Market Forge Co., Everett, Mass.

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To Solve Your Filter Problems

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2. ANTHRAFILT, the hard coal filter medium, will increase rates and lengths of filter runs.

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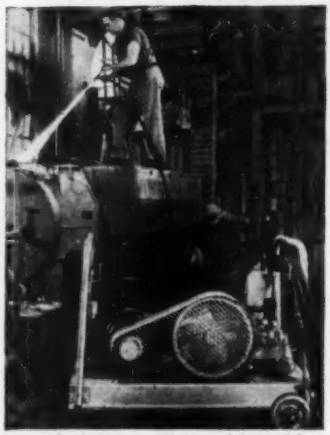

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Here's a time-saving, money-saving, *completely portable* High Pressure Cleaning Unit that does a *better* job of cleaning screen slots on Bird screens, washing out holes on suction couch and press rolls, removing white scale and other incrustations from vats, quick cleaning of Fourdrinier after wire is removed! Cleans walls, floors and equipment faster, easier! 300 to 1000 psi-jet of hot or cold water washes away refuse, residue and debris without harming machinery. Praised by users everywhere for its efficiency, portability and ease of operation! Two sizes . . . 10 gal. per minute pump with 1 gun or 20 gal. per minute with 2 guns.

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FOR SALE—Six cylinder board machine including primary and main presses, dryers, calender stacks, cutter, etc., suitable for manufacture of board or paper usually made on cylinder machines. Address: Box 521, The Paper Industry.

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"the *Bauer* story on Sulphite"

O Three sets of samples are included in the treatise bearing the above title. The tabs are actual samples of products made in pulp and paper plants.

Seven samples in one set are products resulting from disk-milled knotter and fine screen rejects.

Five samples in another set are swatches made from sulphite pulp refined in disk mills for newsprint.

Eight samples in the third set are swatches of paper made from disk-refined screened sulphite.

Not only are the samples interesting in themselves, but they are illustrative of data on freeness, mullen test, tear test, power consumption, and tonnage capacity. Information on high-yield sulphite pulp is also included.

Now, of course, there's considerable work connected with collating "The Bauer Story on Sulphite." So we don't wish to send copies out to people who are merely curious; but we'll be glad to send a copy, upon request, to anyone who is actively engaged in the production of sulphite pulp or paper. Be sure to ask for a copy if you qualify.

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The Paper Industry New Literature

Books

SOURCES OF INFORMATION IN THE AMERICAN GRAPHIC ARTS, occasional papers No. 2, March, 1951, George J. Mills. Published by Carnegie Press, Carnegie Institute of Technology, Pittsburgh, Pa. 70 pages. Paperbound. 9 x 6. $2.00.

First of a projected series, this book of listings of materials available on virtually every phase of the graphic arts answers the type of questions often asked the author in his capacity as assistant professor of the Department of Printing Management at Carnegie Institute of Technology.

Mr. Mills has arranged his text into two sections—Bibliographic Section and Sources Section. Approximately two-thirds of the book concerns itself with bibliographies of books, periodicals, and directories. This section includes material on administrative publications, advertising, bookbinding, copy preparation, newspaper production, and upon twelve other graphic art subjects including paper.

Periodicals discussing advertising, packaging, paper, photography, printing processes and publishing are included in the periodical section; directories are not subclassified.

The section entitled Sources suggests libraries, schools, trade associations, labor organizations, research programs and miscellaneous groups which have research material available.

PLANT ENGINEERING HANDBOOK. Edited by William Staniar; 87 contributors. Published by McGraw-Hill Book Co., 330 West 42nd St., New York. 2007 pages. 9 x 6 $15.00

Written for industrial executives responsible for organization, design, construction, operation and maintenance, this volume is intended as a supplement to the usual one-subject specialized engineering text. The volume, written by men selected from 46 leading industrial firms and five universities, will serve as a summary of material found in greater detail elsewhere.

The book concerns itself with industry's consumption and conservation of basic resources, with management engineering, with industrial construction, fire protection, maintenance, industrial power and its uses, air handling, materials handling, and service handling. Covering many subjects vital to efficient industrial and institutional operations, the book deals with the more specialized subjects of instrumentation, bearings and lubrication, engineering materials, and mechanical power.

Divided into 35 sections such as Basic Industrial Costs and Cost Reduction, Materials of Construction, Industrial Water Purification and Treatment, Mechanical Power Transmission, Lubrication, Crushing and Grinding, Trade Waste Disposal, Vibration, Industrial Containers and Packaging Equipment, Plastics, and Patents and Copyrights, each section is fully annoted, with almost innumerable graphs, charts and tables. Each section is fully footnoted, and the book is more than adequately cross-referenced.

SPECIALTY PAPERS, Their Properties and Applications, edited by Robert H. Mosher. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn, N.Y. 520 pages. 5½ x 8½. $10.00.

Nineteen well-known paper authorities contributed to the sections of this volume; each reports on a different product of the paper converting industry, of the materials which go into the manufacture of such items, or on the tests used in the evaluations of specific paper products.

Results of recent intensive research in synthetic resins, pigments and solvents used in paper conversion—as well as new advancements made in processing equipment—are discussed.

The foreword of the text was contributed by Dr. R. S. Aries; R. H. Mosher's introduction to the volume summarizes the expanded and continuously expanding uses of paper in the specialty fields.

A partial list of the section titles would include "Gift Wraps, Fancy Box and Packaging Papers," "High-Gloss Specialty Papers," "Miscellaneous Decorative Papers"; all together, a total of fifteen such paper types (usually broken down into more than three sub-types) are considered.

A 30-page glossary of terms and a thorough cross index completes the book.

MODERN METHODS OF MATERIALS HANDLING. By the Material Handling Institute, Pittsburgh. Published by Prentice-Hall, Inc., 70 Fifth Avenue, New York 11. 248 pages. 11 x 8. $5.50.

This profusely illustrated volume, prepared by the members of the Materials Handling Institute, opens with three chapters of general material entitled "Integrated Handling Proves Beneficial," "Special Truck," and "Handling Bulk Material in Intra-Plant Service."

Following are chapters devoted to 19 specific industries; paper is found under the chapter heading "Paper Products." In 10 pages, this chapter discusses handling paper rolls with fork trucks, selecting heavy cases of paper from storage, from paper to bags, round-steel strapping of folded boxes, and weighing paper rolls on a monorail. Experiences of the A. L. Garber Co., Ashland, Ohio; and Benj. C. Betner Co., Devon, Pa., are included as illustrative of the value of proper mill handling of paper.

A nine page chapter deals similarly with materials handling problems of the printer and/or publisher.

Each section, and each part of a section, of the book is amply illustrated with photos, diagrams, or tables. Photographs are large-size and detailed.

A complete list of companies which are members of the Materials Handling Institute concludes the book.

THE RAPID PAPER COST FINDER. Published by Henry D. Gold, 121 Varick St., New York 13, N.Y. 16 pages. 11 x 8¾. Paperbound. $3.00.

The first of its kind, this book is a series of originally devised pre-calculated tables which offer quick, easy, and accurate paper cost estimates for an extremely wide range of paper stocks, sizes and prices. Tedious arithmetic and human errors involved in paper cost estimates are said to be reduced to a minimum with the use of the tables included.

Papers included in the tabulations are bonds, ledgers, writings, book, coated, offset, text, cover stock, index stock, and bristols.

Booklets and Pamphlets

BOOKLETS ON SAFETY. Published by the National Safety Council, 425 No. Michigan Ave., Chicago 11, Ill. "Aren't People Funny" points out 12 unsafe attitudes which are the hidden causes of many accidents; "K.O. Dirt and Disorder" suggests why it is better, safer, and easier to work in a clean place; "Cry Whoa" concerns itself with off-the-job motor vehicle accidents; and "Safety 'Round the Clock" deals with home safety. Humorous cartoons and light treatment make the booklets attractive.

MULTIWALL PACKAGING GUIDE. Published by Bemis Bro. Bag Co., 408 Pine St., St. Louis 2. This 19 page booklet has been released with the objective of assisting manufacturers in using multiwall paper shipping sacks more efficiently and economically. After discussing the history of paper shipping sacks, the booklet suggests proper methods of storing empty paper bags, the filling and closing of bags, the proper handling of filled bags, and the palletizing of paper bags, as well as several other factors important to consider in the use of bags.

SOLVING ROOF PROBLEMS. Published by The Tremco Manufacturing Co., 8701 Kinsman Road, Cleveland, Ohio. 32 pages. 8½ x

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MACHINE CO • GREEN BAY • WIS
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For heavy duty. Also furnished with tandem axles. Welded steel construction.

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Reports and Designs for Construction or Modernization of Pulp & Paper Mills, Steam and Hydro Power. Stream Pollution Abatement.

11. Illustrated with photographs, drawings and diagrams, this booklet discusses such subjects as the various kinds of roofs, how roofs are built, what factors cause roofs to deteriorate, and how roof problems can be diagnosed and treated. Information included is based on experiments on the Tremco laboratory. A table of contents is provided for the 15 sections included.

AMERICAN STANDARD METHODS OF MEASURING AND SPECIFYING COLOR. Sponsor, Optical Society of America; published by American Standards Association, Inc., 70 East 45th St., New York 17, N.Y. 15 pages. 8¾ x 11. 50c. Three standards—Method of Spectrophotometric Measurement for Color, Method for Determination of Color Specifications, and Alternative Methods for Expressing Color Specifications — approved April 13, 1951, are reported upon in this booklet. These standards represent general agreement of maker, seller, and user groups on the best current industrial practice with regard to the problems of measuring and specifying color.

COLLECTIVE VOLUME II. Published by New Products Development Department, American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y. This bulletin is a compilation of data on several new chemicals which have become available from American Cyanamid's research laboratories in the past year. Some of the chemicals reported on, all of which are discussed more completely in separate bulletins, are: beta substituted propionitriles, three-substituted propylamines, Dipropionitriles, two nitrodiphenylamine, two aminobenzenethiol, Antioxidant 2246, and sodium dicyanamide.

SURVEY OF THE PRESENT AND POTENTIAL INDUSTRIAL USES OF STRAW, with special reference to Nebraska. Published by The Experiment Station, University of Nebraska College of Agriculture, Lincoln, Nebr. 47 pages. This booklet reports results of a study made by the Experiment Station concerning the possibilities of situating a strawboard, straw pulp, or straw insulating board mill in Nebraska. The research disclosed facts which predict a good future for such a mill in either Keith County, Kearney County, or Adams County. These three sections possess facilities necessary for such a mill—water, power, fuel, transportation, manpower—and at least a small local market is assured.

Manufacturers' Publications

Through the co-operation of manufacturers and suppliers, THE PAPER INDUSTRY *lists the following catalogues, bulletins, and booklets. They may be obtained without cost or obligation, unless otherwise specified, by writing direct to the manufacturers. Please address requests on your company letterhead.*

Car Shaker. Allis-Chalmers Mfg. Co., 991 S. 70th St., Milwaukee, Wis. — Bulletin 07B7221A describes the car shaker for unloading granular material from hopper-bottom gondola cars. Construction details and time-saving and safety features are given.

Zeolite Softener. Cochrane Corp., Philadelphia 32, Pa.—Bulletin 4520, titled "Cochrane Zeolite Softeners featuring the Cochrane Hydromatic Single Control Valve," gives a detailed explanation of the sodium zeolite softening process, from beginning to end. Definitions are given and the four steps of operation are covered.

Structural Steel. William F. Klemp Co., 6636 S. Melvina Ave., Chicago, Ill.—An entirely new 1951 technical manual describes structural steel footwalks, open steel grating and treads, Hexteel heavy duty armor, reinforcement meshes, Floorsteel floor armor, open steel and aluminum bridge decking, and Flexteel flexible open steel conveyor belt.

Rosin Size Emulsifier. American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N.Y. —Technical Bulletin No. 25 is on the Automatic Emulsifier for liquid rosin size. It explains how the unit is attached to rosin-size storage tanks and how it operates to discharge dilute emulsion.

Air Compressor Drives. Electric Machinery Mfg. Co., Minneapolis 13, Minn.—Issue No. 32 of the **E-M Synchronizer,** 24 pages, is devoted to motor drives for all types of large air compressors. Included is a technical discussion of various special phases of engineering and operating compressor installations. A reference booklet.

Oil Burners. Ray Oil Burner Co., 401-499 Bernal Ave., San Francisco 12, Calif.—A 16-page catalogue gives a complete listing, with illustrations, of the company's oil burner products, including automatic horizontal rotary type, steam turbine driven type, combination gas-oil type and pressure atomizing type. A selector chart is also given.

Waterproof Coatings. Carbide and Carbon Chemicals Div., Union Carbide and Carbon Corp., 1049 Niagara Bldg., Niagara Falls, N.Y. —A new bulletin on NIAPROOF water-repellent finishes describes how to apply them to paper, wallpaper, wallboard, boxboard and other paper products.

Loading Docks. Stedfeld & Byrne, Inc., 1220 Huron Rd., Cleveland 15, Ohio—A 4-page bulletin on Adjust-A-Docks shows models of these adjustable loading docks. Savings in dock space, handling time, labor and breakage are discussed.

Waxes. Concord Chemical Co., Moorestown, N.J.—A booklet of 16 data sheets covers 11 waxes which, it is claimed, replace carnauba and Japan waxes at lower cost. Also covered are five types of cresylic acid, an important import of this company.

Gauges and Telemeters. Bristol Co., Waterbury 20, Conn.—Bulletin L700 describes water and liquid level gauges for reservoirs, elevated tanks, rivers, irrigation systems, flumes, etc. Many types are covered, and applications to chemical processes are included. Bulletin DM029 is on the Metameter telemeter for remote measurement and automatic control of variables.

Jacks. Buda Co., Harvey, Ill.—Catalogue No. 1515, 16 pages, illustrates and describes the complete line of Buda ratchet, screw and hydraulic jacks in capacities from 3 to 75 tons. Tables help in selecting the correct model.

Safety Devices. Mine Safety Appliances Co., Pittsburgh 8, Pa.—Bulletin No. CH-2, 4 pages, describes all parts and operation of the Pneolator, an automatic artificial respiration device. Bulletin No. CN-4, 4 pages, pictures and describes M-S-A face shields and visors for guarding against chemical splash, sand, sparks, etc.

Pressure Tanks. American Car and Foundry Co., 30 Church St., New York 8, N.Y.—"Welded Pressure Vessels," 16 pages, covers a line of tanks for transport or storage of liquefied gasses. Underwriters' and Association of American Railroads' specifications are stressed.

Flow Rate Testing. Fischer & Porter Co., Hatboro, Pa.—Technical Report A-9C-4, on fluid flow rate testing for aircraft engines and accessories, was originally prepared for company engineers. Now available to industry, it contains a complete discussion of engineering principles as well as detailed flow curves and charts.

Colloidal Graphite. Acheson Colloids Corp., Port Huron, Mich.—Bulletin 427, 6 pages, describes how "dag" colloidal graphite dispersions are used profitably in several industries, including corrugated boxboard manufacturing. Treatment of parts to prevent sticking, corrosion, galling and "freezing" is described.

Bark Crusher. Squier Corp., Div. of Buffalo Forge Co., Buffalo, N.Y.—A 4-page booklet itemizes advantages of the Squier bark crusher. Its rugged construction is described with a photograph, and the efficiency of burning its fine bark particles is emphasized.

Chemical Engineering. R. S. Aries & Associates, 400 Madison Ave., New York 17, N.Y. —An envelope-size folder describes the services, lists the personnel, and lists the industries which have used the service of this firm of consulting chemical engineers. Complete plant design is offered.

Process Equipment. Patterson Foundry & Machine Co., East Liverpool, Ohio—A 36-page condensed catalogue, No. CEC-50, describes and illustrates the processing machinery designed and built by Patterson. Equipment for agitating and mixing, kneading and blending, grinding, classifying, synthesizing and processing is featured.

Waste Paper Treatment. Cowles Co., Inc., Cayuga, N.Y.—Cowles Technical Bulletins 1-4 describe the following: 1—Defibering Standard Sheets; 2—Comparison of intermediate vane and low vane impellers as applied to the Cowles side drive pulper; 3—The Cowles deinking system; 4—The Cowles waste paper system, for capacities of 75 tons per day or less.

Maintenance Chart. United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, O.—A 6-page "Maintenance Checking Chart" lists many common building maintenance problems, along with over 100 products and processes for solving them. Products have been tested and approved by United Laboratories.

Laboratory Refiners. Sprout Waldron & Co., Inc., Muncy, Pa.—Bulletin 17, 4 pages, covers the "Lab" refiner for experimental study of pulping. Diagrams and photos give all specifications. Also described is a hand feeder for use with the refiner.

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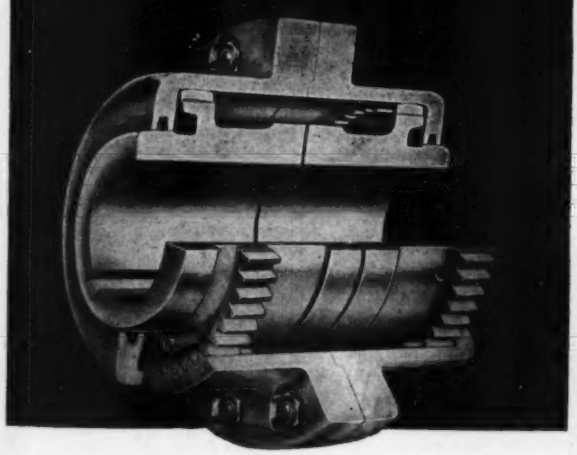

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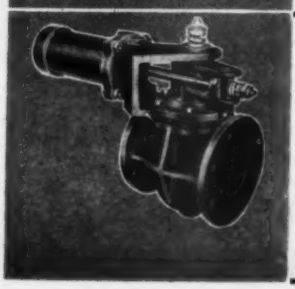

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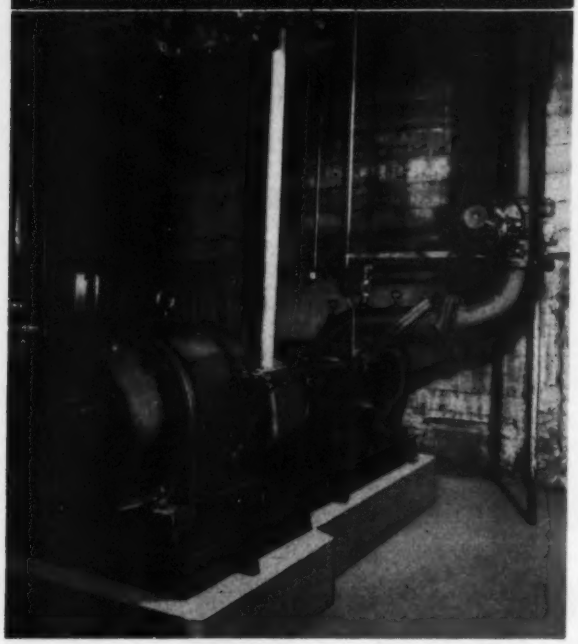

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MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

The following are OPS ceiling prices, cents per pound, delivered mills:

	per cwt.
Blue Overalls	14.50
Corduroy	8.00
Washables, No. 1	6.50
Percales	12.50
Light Prints, No. 1	11.50
Khaki Cuttings—	
Sun Tan	11.50
Mixed	8.00
New White Canvas	19.00
Canton Flannels, bleached	21.00
Canton Flannels, unbleached	21.00
Shirt Cuttings—	
New White No. 1	21.00
Silesias No. 1	16.00
New Unbleached	21.00
Fancy	10.00
Linen Cuttings—	
American	14.50
White	21.00
Grey	21.00

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Roofing—	
No. 1	2.45 to 2.55
No. 2	2.35 to 2.45
No. 3 and 4	2.25 to 2.35
Twos and Blues—	
Repacked	4.75 to 5.00
Thirds and Blues—	
Repacked	4.25 to 4.50
Miscellaneous	3.75 to 4.00
Whites, No. 1—	
Repacked	6.00 to 6.50
Miscellaneous	4.50 to 4.75
White, No. 2—	
Repacked	4.50 to 4.75
Miscellaneous	3.75 to 4.00

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	8.25 to 8.75
Domestic	8.50 to 9.00
Wool Tares—	
Light	9.50 to 10.00
Heavy	10.00 to 11.00
No. 1 Scrap Bagging	7.50 to 8.00
Manila Rope—	
No. 1 large	9.00 to 9.50
No. 1 small	8.00 to 8.50
Sisal Rope—	
No. 1 large	8.00 to 8.50
No. 1 small	7.50 to 8.00
New Burlap Cuttings	9.00 to 10.00
Jute Threads—	
Foreign (Nom.)	7.50 to 8.00
Domestic	7.50 to 8.00
Strings—	
No. 1 sisal	5.50 to 5.75
No. 2 sisal	5.00 to 5.25
Soft jute	5.25 to 5.50
Mixed	3.50 to 3.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	225.00—
Hard White, No. 1	190.00—
Soft White, No. 1	150.00—
Soft White, one-cut	170.00—
Soft White, Misc.	135.00—
Fly Leaf, No. 1	80.00—
Fly Leaf, Woody No. 1	60.00—
No. 2 Mixed Col. Woody	50.00—
Flat Stock—	
No. 1 Heavy Books and Magazines, Repacked	55.00—
Mixed Books	35.00—
Ledger Stock—	
No. 1 White	125.00—
No. 1 Mixed (Colored)	95.00—
Manilas—	
New Env. Cuttings	135.00—
New Env. Cuts, One-Cut	—
Extra Manilas	85.00—
Manila Tab Cards, Free of Ground Wood	150.00—
Colored Manila Tab Cards	115.00—
Kraft—	
New Envelope Cuttings	150.00—
Tripled Sorted No. 1 100%	100.00—
No. 1 Old Assorted	80.00—
News—	
White Blank	95.00 to 100.00
Overissue	27.00—
No. 1 Folded	23.00—
Old Corrugated Container	55.00—
New Jute Corrugated Cuts	60.00—
Mill Wrappers	22.00—
Box Board Chips	20.00—
No. 1 Mixed Paper	20.00—

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.55—
Ground, cwt.	4.30—
Powdered, cwt.	4.70—
Blanc Fixe—	
Pulp, bulk, ton	90.00—
Dry, barrels	95.00—
Bleaching Powder—	
Drums, cwt.	5.00 to 6.00
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	42.50 to 43.50
Argentine, lb.	39.50 to 40.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.80 to 3.05
Gelatine (silicin), lb.	1.25 to 1.35
Glyc. (C.P.) drums, lb.	.50 to .55
Litharge, powd. bbl. lb.	.18¾ to .20
Rosin (Gum)—	New York, per 100 lbs.
B	9.95—
F	9.95—
G	9.95
WW	10.45—
Rosin (Wood), carlots, F.O.B. South	7.30—

MARKET QUOTATIONS

Salt Cake—	
Dom. bulk (wks) ton	22.00 to 24.00
Imp. bulks on dock— (Atl. ports) ton (Nom.)	25.00—
Soda Ash—	
Bulk (works) cwt.	1.30—
Paper bags, cwt.	1.50—
Soda (Caustic)—	
Solid drums, cwt.	3.35 to 3.40
Ground and flake, drums, cwt.	3.75 to 3.85
Sodium Silicate—	
60 deg. 55 gal. drums, (works) cwt.	1.80 to 1.90
40 deg. 35 gal. drums, (works), cwt.	1.50 to 1.60
Starch—	
Pearl, 140 lb. bags, cwt.	6.09—
Pearl, barrels, cwt.	6.09—
Paper (Sp.) bags, cwt.	6.09—
Powdered, barrels, cwt.	6.32—
Sulphur (Crude)	
(Mine) bulk, long ton	22.00—
Talc—	
Dom. 100 lb. bags (mine) ton	35.00 to 38.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig, bbls., lb.	.21 to .21½
Calcium Pig, bbls., lb.	.21 to .21½
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, with inland freight allowed, are:

Bleached sulphite, Swed.	275.00—
Bleached sulphite, Finn.	225.00—
Bleached sulphite, Can.	160.00—
Bleached sulphite, dom.	135.00—
Easy bleaching sulphite	—
Unbleached kraft, Finn.	200.00—
Unbleached sulphite, Swed.	250.00—
Unbleached sulphite, dom.	140.00—
Unbleached Sulphite, Can.	142.50—
Unbleached kraft, Swed.	250.00—
Unbleached kraft, Finn.	200.00—
Unbleached kraft, Can.	145.00—
Unbleached kraft, northern	140.00—
Unbleached kraft, southern	120.00—
Bleached sulphate, Swed.	280.00—
Bleached sulphate, Can.	185.00—
Bleached sulphate, dom.	135.00—
Bleached soda, Canadian	155.00—
Bleached soda, domestic	140.00—
Sulphite screenings, dom.	40.00 to 50.00
Groundwood, domestic	85.00 to 100.00
Groundwood, Canadian	95.00—

PAPER

f.o.b. New York City

Boards—	per ton
Binders	140.00—
Chip	105.00—
Chip, tube and can	115.00—
Chip, full blending	117.50—
Chip, sgl. mla. lined	130.00—
Coated, white patent .016	175.00 to 185.00
.020 and heavier	165.00 to 175.00
Kraft liner	115.00—
Filled News	107.50 to 110.00
Container	130.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	17.40—
B Grade E. F.	17.65—
A Grade S. C.	18.15—
B Grade S. C.	16.90—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White	
No. 1 Glossy	23.40—
No. 2 Glossy	21.90—
No. 3 Glossy	20.40—
No. 4 Glossy	—
No. 2 Offset	17.40—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond— (In Ton Lots)	per cwt.
Extra 100% Rag	70.45—
100% Rag	62.45—
75% Rag	48.15—
50% Rag	38.90—
25% Rag	31.65—

Rag Content Ledger— (In Ton Lots)	per cwt.
Extra 100% Rag	72.65—
100% Rag	63.90—
75% Rag	49.40—
50% Rag	40.20—
25% Rag	33.00—

Sulphite Bond—	per cwt.
Air dry, watermarked	—
No. 1 watermarked	19.05—
No. 2 watermarked	18.10—
No. 4 watermarked	17.10—

Sulphite Ledger—	per cwt.
No. 1 watermarked	21.15—
No. 2 watermarked	21.00—
No. 4 watermarked	20.40—

Glassine (f.o.b. mill)—	per cwt.
Embossed (25 lb. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof—	
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—

News—	per ton
Rolls, Standard (Contract)	106.00 to 110.00
Rolls (Spot)	(Nominal)
Sheets	—

Tissues (Carlots)—	per ream
White No. 1	1.95—
White No. 2	1.85—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.85—
Manila	1.95—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.90—
Napkins, full crepe and embossed (12½ lb. to M shts.) per cs.	.90—
Toilet, Bleached (M shts.) per cs.	9.85—
Toilet, Unbleached (M shts.) per cs.	6.60—

Towels	per case
Bleached	6.65—
Unbleached	5.65—

Wrappings (Kraft)—	per cwt.
Super-Standard	9.25 to 9.50
No. 1 Wrapping	8.25 to 8.50
Standard Wrapping	7.75 to 8.00
Standard Bag	7.50 to 7.75
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)	per cwt.
Bleached Papers—	
M.F. & M.G. Waxing, 20 lb. (carloads only)	—
(10,000 lb.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers	
Com. Gr. Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch. & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—

Manilas—	
Envp. Mla., Sub. 16-40 (No. 1)	—
Env. Mla., Sub. 16-28 (No. 2)	—
Envp. Mla. (Prices based on large sheets untrimmed ream marked, in bdls.)	—
Wrapp. Mla. 35 lb. up—	
No. 1	8.75 to 10.25
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B-20 lb.	—
Grade A-22 lb.	—

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This is a series of six 35mm sound slidefilms with leader's manual that may be used for an advanced safety course. Each film deals with one aspect of the complex art of handling people. Collectively, the films show how to train workers, how to keep experienced people on their toes and how to win respect, cooperation and loyal support.

SAFETY MANAGEMENT FOR FOREMEN

A set of ten 35mm sound slidefilms—all that is needed for a course in safety fundamentals. The films explain how to organize a safety program, what part the foreman plays in the program and how safety increases production. They also discuss specific safety activities, such as machine guarding, safety inspections, the first aid program, etc. Complete with leader's manual in an attractive leatherette case.

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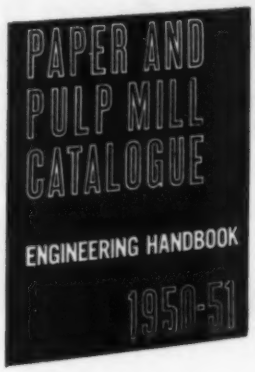

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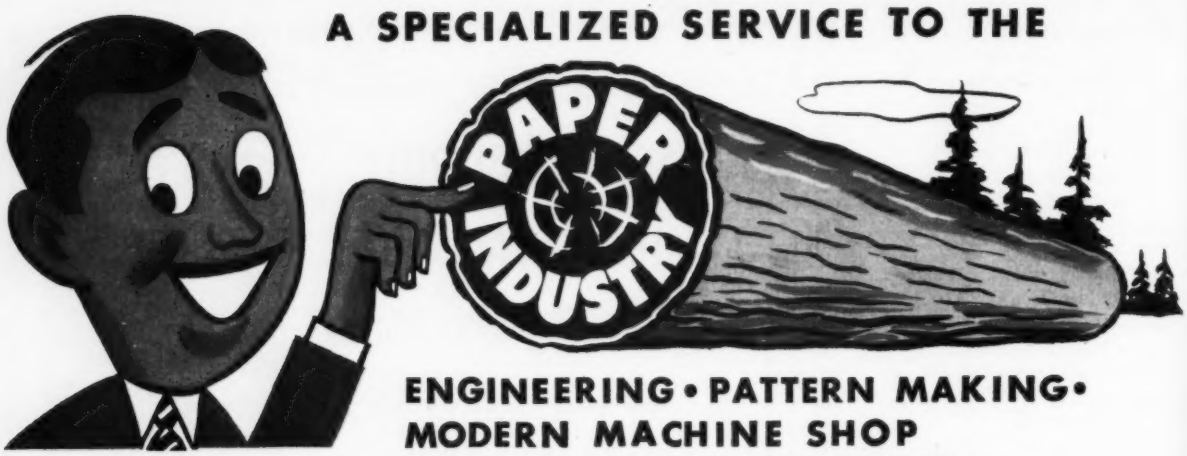

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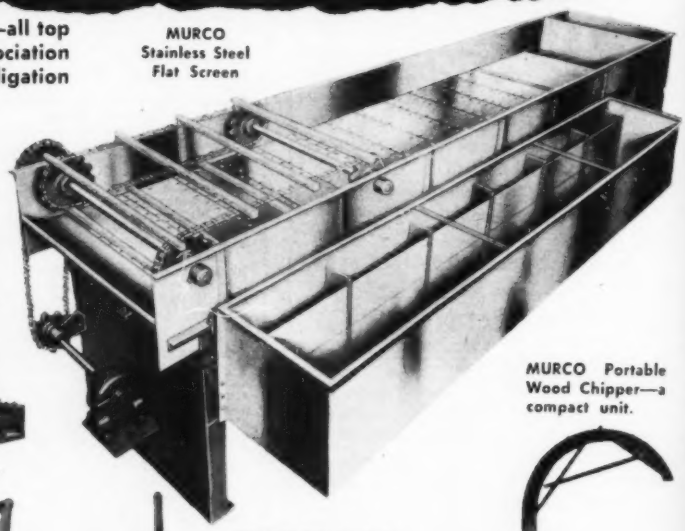
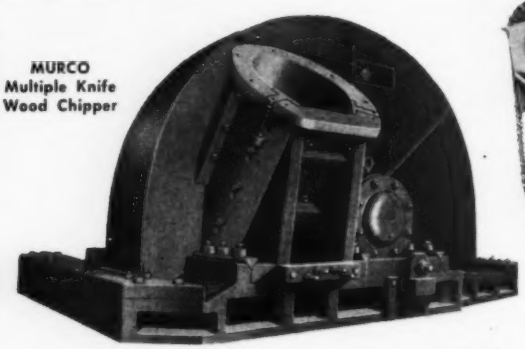


MURCO Multiple Knife Wood Chipper



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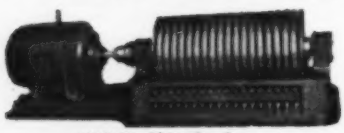
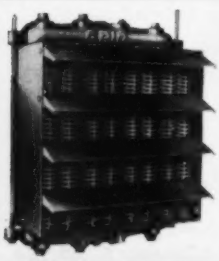


MURCO Chip Crusher



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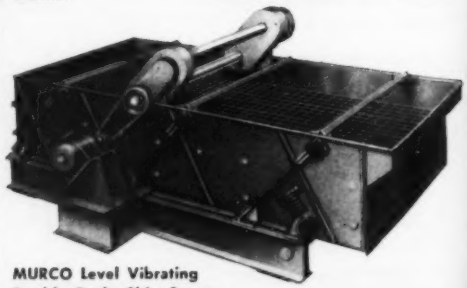

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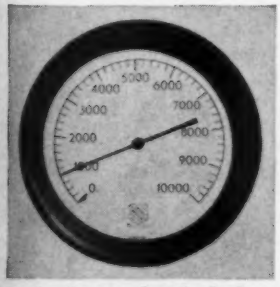
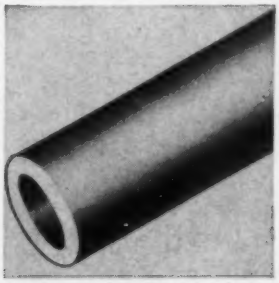
In flaring test, tube I.D. must expand 20% without cracking or showing flaws.

Tubes must have Rockwell hardness number not exceeding B89.



Each tube tested under hydrostatic pressure of 1,000 p.s.i. before shipment.



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